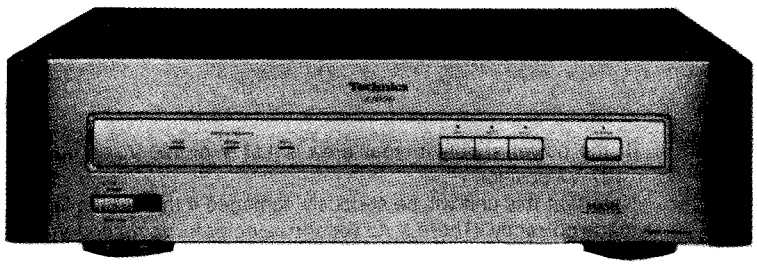
ORDER NO. AD9010309C2

Service Manual

Digital Processor

SH-X1000



Color

(A)...Gold Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(A)
(EB)	Great Britain.	
(EG)	F.G. Germany & Italy.	

SPECIFICATIONS

■ AUDIO

Frequency response	2 Hz~20 kHz ±0.2 dB
S/N ratio	120 dB
Dynamic range	98 dB
Total harmonic distortion	0.0018 %
Harmonic distortion	0.0008 %
Channel separation	110 dB
Output voltage	2.5 Vrms
Wow and flutter	Below measurement limit
Output impedance	600 Ω
Load impedance	more than 10 kΩ
Balance output	
Output impedance	600 Ω
Load impedance	more than 5 kΩ

■ DIGITAL

Digital filter	8 fs 20 bit MASH
D/A converter	64 fs 20 bit PWM twin DAC
Digital signal processor	Floating decimal point 24 bit processing
Jitter free memory	256 kbit × 6
Digital input	Optical × 2
	Optical/coaxial changeover × 1
Digital input frequency	48 kHz ±0.1 %
	44.1 kHz ±0.1 %
	32 kHz ±0.1 %
Digital output	Optical × 1
Analog output	unbalance × 1
	balance × 1

■ GENERAL

Power consumption	24 W
Power supply	AC 50/60 Hz, 110 V/127 V/220 V/240 V
Dimensions (W × H × D)	484 × 139 × 419 mm
Weight	20 kg

Note:
Specifications subject to change without notice.
Weight and dimensions shown are approximate.

Technics

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■ BEFORE USE

Be sure to disconnect the mains cord before adjusting the voltage selector.
Use a flat-tip (−) screwdriver to set the voltage selector (on the rear panel) to the voltage setting for the area in which the unit will be used.

(If the power supply in your area is 117 V or 120 V, set to the "127 V" position.)
Note that this unit will be seriously damaged if this setting is not made correctly. (There is no voltage selector for some countries; the correct voltage is already set.)

This unit employs a lithium battery for back-up of the memory if a power failure occurs, but this battery will no longer provide that back-up if it becomes weak. If battery replacement is necessary, consult with the store where the unit was purchased, or any store where Technics or Panasonic products are sold, or an authorized Service Center. This battery must only be replaced by suitable qualified service personnel.

WARNING

LITHIUM BATTERIES. POSSIBLE EXPLOSION DANGER. CHANGE OF BATTERIES MUST ONLY BE DONE BY QUALIFIED PERSONNEL.

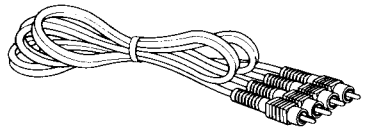
■ TROUBLESHOOTING GUIDE

Before requesting service for this unit, check the chart below for a possible cause of the problem you are experiencing. Some simple checks or a minor adjustment on your part may eliminate the problem and restore proper operation.
If you are in doubt about some of the check points, or if the remedies indicated in the chart do not solve the problem, refer to the directory of Authorized Service Centers (enclosed with this unit) to locate a convenient service center, or consult your Technics dealer for instructions.

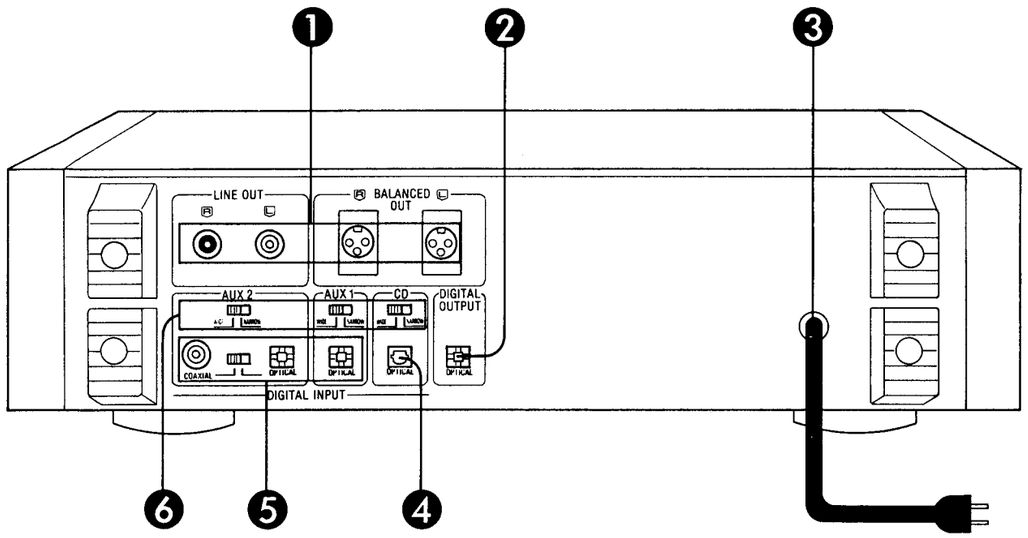
Problem	Probable cause(s)	Suggested remedy
Problems noted at all times		
No sound is heard when the power is switched ON.	The power cord plug is not completely inserted.	• Confirm that the power cord plug is connected completely.
	Connections are incomplete or incorrect to the speaker systems, etc.	• Check to be sure that all connection wires are correctly connected.
	The optical fiber cable is not completely connected.	• Insert until there is a snap.
	A digital output ON/OFF changeover button is on the connected equipment, and it is OFF.	• Turn ON.

■ ACCESSORY

Stereo connection cable 1
(SJPD18)



■ CONNECTIONS

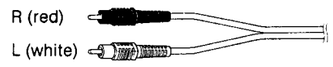


❶ Analog output terminals

Connect to the amplifier input terminals.

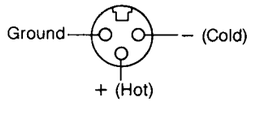
LINE OUT
Connect to an amplifier that has RCA type input terminals. Use the included stereo connection cable.

Stereo connection cable



BALANCED OUT
Connect to an amplifier that has a cannon type input terminal (balanced output).

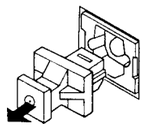
Cannon terminal



❷ Digital output terminal (DIGITAL OUTPUT)

Connect to digital equipment (digital amplifier, etc.) that has an OPTICAL input terminal. Use a optical fiber cable (not included).

How to use OPTICAL terminal



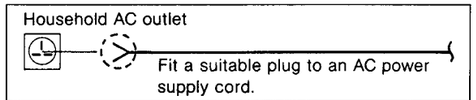
Remove the dust cap.

Notes:
- Do not bend the cable excessively.
- Be sure to replace the dust cap when not using the terminal.

❸ AC power supply cord

Connect to an AC outlet.

For United Kingdom

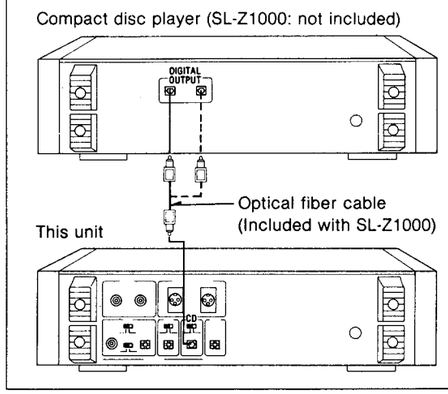


Notes:
- Configuration of the AC outlet and AC power supply cord differ according to area.
- Connect this cord only after all other cables have been connected.

❹ CD input terminal (DIGITAL INPUT/CD)

Connect a compact disc player that has an OPTICAL output terminal. Use an optical fiber cable (not included).

Connections to recommended compact disc player (Technics; SL-Z1000)

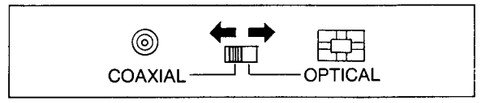


❺ Digital input terminal (DIGITAL INPUT)

AUX 1
Connect the 2nd or 3rd compact disc player, DAT or video disc player that has an OPTICAL output terminal.
Use an optical fiber cable (not included).

AUX 2
Connect the 2nd or 3rd compact disc player, DAT or video disc player that has an OPTICAL output terminal or COAXIAL terminal. For the OPTICAL output terminal use an optical fiber cable (not included). For the COAXIAL output terminal use a coaxial cable (not included).

Change the switch to type of terminal being used.



❻ WIDE/NARROW changeover switches (WIDE/NARROW)

Change according to the frequency deviation* of the input source.

NARROW
Used when the frequency deviation is small.
(Normally use in this mode.)

WIDE
Used when frequency deviation is large.
[(Please note that there is a time delay of approximately 0.4 seconds between the input source signal and the output signal (sound heard by the ears) when the units is in the jitter free mode.]

*Frequency deviation indicates the dispersion of the frequency compared to the standard frequency.

Reference

About the OPTICAL terminal

With the optical connector terminal, high quality digital audio signals can be sent without any influence from electric noise from outside sources because the electric signal is converted to an optical signal and then sent.

About the COAXIAL terminal

This is a 75-ohm coaxial terminal. It is electrically insulated to prevent generation of noise between equipment and to prevent a deterioration of the signal.

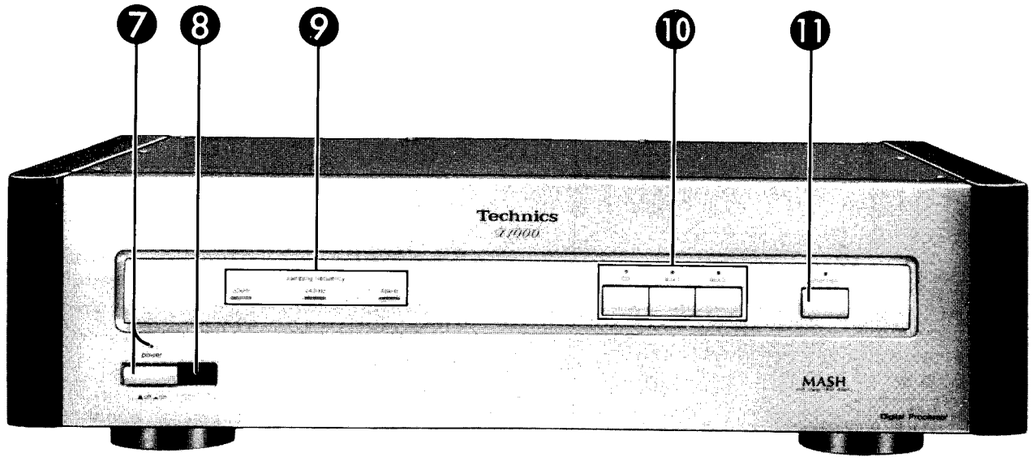
Purpose of WIDE/NARROW changeover

An independently developed jitter free interface is built into this unit to prevent deterioration of sound caused by jitter*1. This unit normally operates in a jitter free mode*2 but when the frequency deviation is large it automatically changes over to the PLL mode*2. (The jitter free indicator on the front panel goes out.) At such a time, it can be made to operate in the jitter free mode by changing to the WIDE position and pressing the jitter free button on the front panel. (It will not change to the jitter free mode if the frequency deviation is very large.)

*1 Jitter is what causes time variations in the signal waveform depending on the connected cable, and unclear and deteriorated sound.

*2 Refer to the "Description of Technical Features" (see pages 9, 10) for details about the jitter free mode and PLL mode.

■ FRONT PANEL CONTROLS AND FUNCTIONS



❼ Power switch and indicator (power)

❽ Remote-control signal receptor

If you use this unit with a separately purchased compact disc player (Technics: SL-Z1000) the signal can be received with the remote control that comes with that equipment and the input source can be changed.

❾ Sampling frequency indicator (sampling frequency)

It detects the sampling frequency of the input digital signal and illuminates accordingly. This indicator will illuminate if a digital signal is received, regardless of whether the digital equipment is performing or not.

- **32 kHz:** DAT 32 kHz mode, etc.
- **44.1 kHz:** CD, DAT (when playing back software tape)
- **48 kHz:** DAT 48 kHz mode, etc.

❿ Input selectors and indicators (CD, aux 1, aux 2)

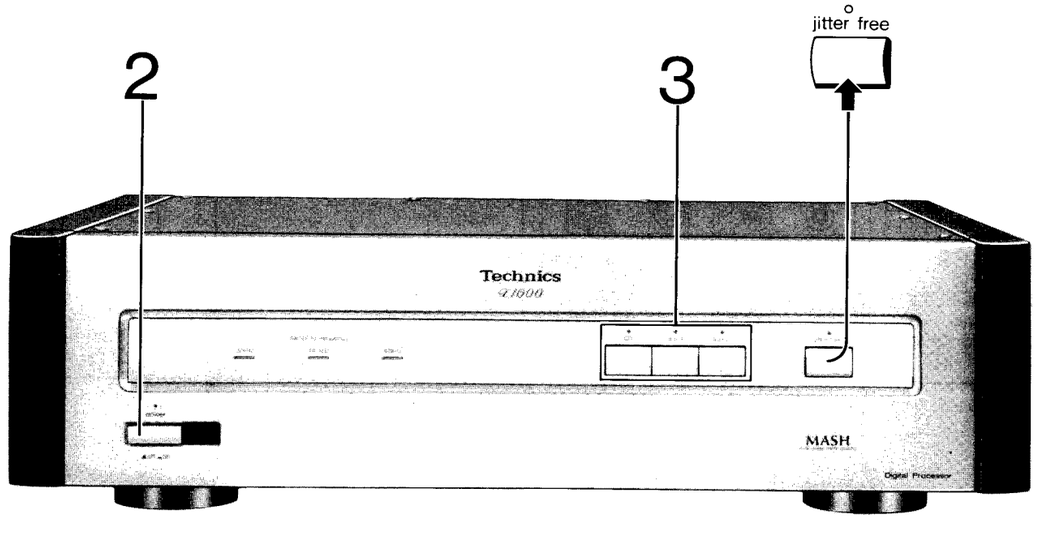
These selectors are used to select the sound source to be heard.
The indicator will illuminate when the selection is made.

⓫ Jitter free button and indicator (jitter free)

Changes between jitter free mode and PLL mode.
The indicator illuminates in the jitter free mode.

Refer to the "Description of Technical Features" (see pages 9, 10) for details about the jitter free mode and PLL mode.

■ OPERATIONS



1 Set the power switch of the equipment used to ON.

Note:
After use, be sure to switch OFF the power.

2 Set the power of this unit to ON.

(The indicator will illuminate.)

3 Select the input source.

(The selected source indicator will illuminate.)

- **CD:** Press this button to listen to compact discs.
- **aux 1:** Press this button to listen to sound from equipment connected to the "AUX 1" terminals of this unit.
- **aux 2:** Press this button to listen to sound from equipment connected to the "AUX 2" terminals of this unit.

4 Follow the instructions of the equipment being used to begin play.

Changeover with the jitter free button.

Each time the button is pressed it switches between the jitter free mode (indicator illuminates) **and PLL mode** (indicator goes out).

Note:
The position of the mode matching the input sources is kept in memory for each source even after the power is switched OFF.

When the frequency deviation of the input source is large, this unit automatically changes to the PLL mode.
In the jitter free mode with the WIDE/NARROW changeover switch on the rear in the WIDE position, there is a time delay of approximately 0.4 sec. between the input source signal and the output signal (sound heard by the ears).
Consequently, when enjoying video and sound from a video disc player with large frequency deviation, there is a time discrepancy between the sound and video. If this bothers you, change over to the PLL mode.

■ DESCRIPTION OF TECHNICAL FEATURES

Top grade MASH 1-bit D/A converter system

Development background

Up to the present time, audio characteristics have been improved by using high fs and high bit in digital filters but, compared to improvements of such digital signals, the improvement of conventional resistance ladder type D/A converters has lagged behind. On the other hand, by improving the digital signal, the following D/A converter problems received closer attention.

1. Poor linearity at low signal levels.
2. It is difficult to adjust distortion such as MSB distortion (called zero cross distortion) and other 2SB and 3SB distortion to zero at all input levels.
3. Glitches (spike noise) caused when the bit changes adversely affects sound quality.

MASH features

The "MASH 1-bit D/A converter" is what solves these problems, reproducing, without loss, all information on the disc and creating rich, unlimited musical sound that gives the feeling of being present. (MASH is an abbreviation for multi-stage noise shaping.)

MASH can be divided into three sections; the digital filter, noise shaping section and 1-bit D/A converter.
The digital signal input into the digital filter is first over-sampled, then the bits are compressed in the noise shaping section and the noise components are again taken outside the audible range. Finally, it is converted to an analog signal in the 1-bit D/A converter.

What is basically different from the conventional idea is not that the analog quantity value is shown on a voltage axis but that the analog value is shown on a time axis.
Since there are only two values, "L" and "H", in the direction of voltage amplitude, basically there is no error in the direction of the voltage amplitude. Furthermore, even in the direction on the time axis, there is extremely high accuracy because crystal oscillation is used as the oscillation source for the clock signal. As a result, it exhibits outstanding conversion linearity for all signals, large and small, and reproduces clearly fine nuances included in music signals.

Technics started development of MASH before other companies, and this year developed the "top class MASH 1 bit D/A converter system" that can be built into high grade models as the 3rd generation MASH. (Refer to Fig. 1 Audio circuit block diagram.)

The following are the major differences from the previous MASH.
1. There is no processing error since input of the DF+MASH chip is 20 bits to handle all the digital signals output from the DSP in the previous stage.
2. It consists of 3 chips, DF+MASH chip and twin PWM (Pulse Width Modulation) chips; digital noise does not cross over to the PWM chip and channel separation is improved.
3. The operating clock frequency of the DF+MASH and PWM chips is twice (64 fs) that of the previous types, resolution is 20 bits and the theoretical dynamic range is 123 dB.

Therefore, the frequency vs. distortion characteristics have been greatly improved and the signal level vs. distortion characteristics approaches very closely to the theoretical accuracy of 16 bits. (Refer to Fig. 2 and Fig. 3.)

MASH is a trademark of NTT (Nippon Telegraph and Telephone Corporation).

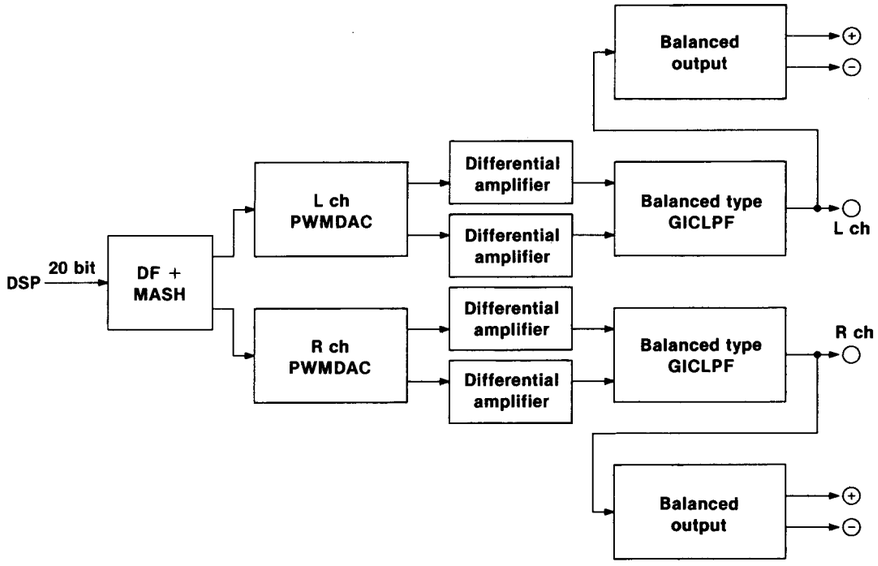


Fig. 1 Audio circuit block diagram

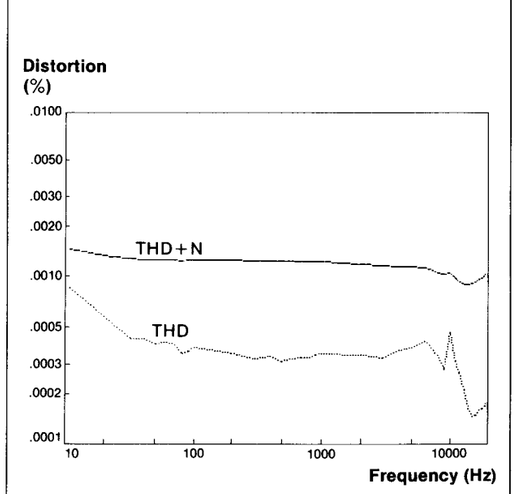


Fig. 2 Frequency vs. distortion ratio characteristic

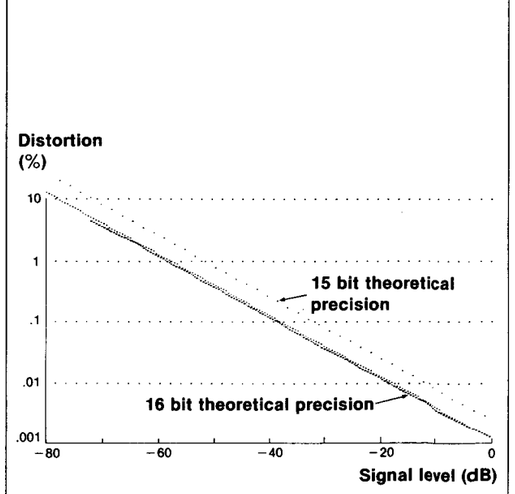


Fig. 3 Signal level vs. distortion ratio characteristic

Jitter free interface

Development background

The transmission of digital data from a reproduction transport to an outboard digital-to-analog converter can introduce problems associated with discrepancies between the clock circuits in the two devices. Long-term problems, which can take minutes or hours to manifest, are known as "drift"; short term problems are known as "jitter". Although the clock frequencies of digital audio equipment are driven by highly stable quartz oscillators which operate at millions of cycles per second, a deviation between one clock circuit and another of only ±2 parts per million is enough to cause problems. Regular consumer compact disc players with digital outputs deviate approximately ±20 parts per million, as do digital audio tape recorders. The Technics SL-Z1000 compact disc player deviates within ±4 parts per million. Consequently, outboard digital-to-analog converters like the SH-X1000 require circuits to control this situation.

The Technics Jitter Free Interface

An important part of the Technics SH-X1000 Digital-to-Analog Converter is the Jitter Free Interface, which compensates for discrepancies between the clock circuits of the data-transmitting transport and the SH-X1000. A block diagram of this circuit can be found on page 10.

The bi-phase signal received by the optical input of the SH-X1000 is converted into an electronic digital audio signal by the "digital audio interface". The "High Performance DSP" digital signal processor routes this data to the "Large Capacity RAM" which is 1.5 mega bit random access memory. This random access memory is the key to the reduction of jitter, and will be discussed in greater detail below.
The data is read out from the RAM according to the master clock of the SH-X1000, and sent to the "DF + MASH" block, where digital filtration is performed at 8 times oversampling with a resolution of 20 bits. Requantization and MASH multi-stage noise shaping are also performed in this stage, preparing the data for application to the twin pulse-width modulation digital-to analog converters ("PWM DAC"). The analog outputs of the DAC's are filtered by the "low pass filter".

The 1.5 mega bit random access memory (RAM) stores the data as it comes into the SH-X1000 so that it can be read out again to the remaining circuits of the SH-X1000 according to the clock circuits of the SH-X1000 instead of the clock circuits of the reproducing transport (the CD transport or the DAT transport). This eliminates any discrepancies between the clock circuits of the transport and the SH-X1000, and, therefore, eliminates jitter.

The "WIDE" mode of operation uses a large amount of the RAM to compensate for transports which introduce a lot of jitter. In the wide mode, almost one hour (58 minutes) of continuous music can be reproduced without any manifestations of drift, even if the frequency deviation of the transport approaches ±100 parts per million. A transport deviating by ±50 parts per million can be operated continuously for at least 113 minutes without any drift error, and a high quality reproduction transport, like the Technics SL-Z1000, which exhibits a frequency deviation of only ±4 parts per million, can operate for more than 12 hours without drift error. ("Continuous operation" means without stopping or pausing the transport or experiencing any "infinity zero" sections between the tracks on the disc. Any of these conditions improves the continuous reproduction time.)

In the "NARROW" mode continuous reproduction time is reduced to: 7 minutes with a deviation of ±100 ppm; 14 minutes with a deviation of ±50 ppm; and 94 minutes with a deviation of ±4 ppm.
However, in the wide mode of operation when "jitter free" operation has been selected on the front panel, so much RAM capacity is used that the digital data coming from the transport is delayed by as much as 0.4 seconds before it is released to the DAC. Consequently, the digital audio from a laser disc player of high frequency deviation would not be in synchronization with the picture on the television. In this case, the "PLL" mode of operation should be used. Also, if the frequency deviation of the source is extreme and uses up the entire 1.5 mega bit RAM buffer, the SH-X1000 will automatically shift into "PLL" mode.
Figure 4 is a spectrogram showing no jitter in the reproduction of signal which has been through the Jitter Free Interface.
(Compare this with Figure 5, which is the spectrogram of a conventional PLL circuit.)

The PLL Circuit

Phase-Locked-Loop (PLL) circuit design is another approach to controlling jitter, especially when buffer-memory designs (like the Jitter Free Interface) cannot be used. But PLL circuits have a problem: Slowing the operating frequency of the circuit to reduce jitter "narrows" it's "lock range", meaning it's tolerance for frequency deviation is reduced (so it is unable to accept a wide range of frequency deviations when it greatly reduces jitter). Conversely, increasing the operating frequency of the PLL increases the lock range but reduces the circuit's ability to control jitter.

Technics has developed a proprietary "digital PLL" to resolve this situation. As is shown in the block diagram on page 14, the digital signal is input to the digital signal processor ("DSP") which uses the random access memory ("RAM") to detect the phase difference between the clock circuit of the reproducing transport and the SH-X1000. The "D/A converter" converts this digitally expressed phase difference into an analog voltage which is applied to the voltage controlled oscillator (VCO). By using a lithium titanate VCO, a wide locking range can be maintained even at the high operating frequency of this device, thereby permitting this unique PLL circuit to greatly reduce jitter while still accepting a wide range of clock frequency deviations from transmitting transports. Moreover, any residual jitter is found outside the audible frequency band width, rendering it harmless to reproduction accuracy.

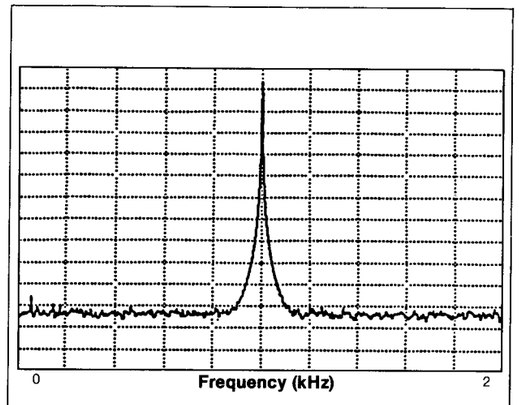


Fig. 4 Audio output spectrogram of the jitter free interface
(With 100 Hz disturbance in 1 kHz signal)

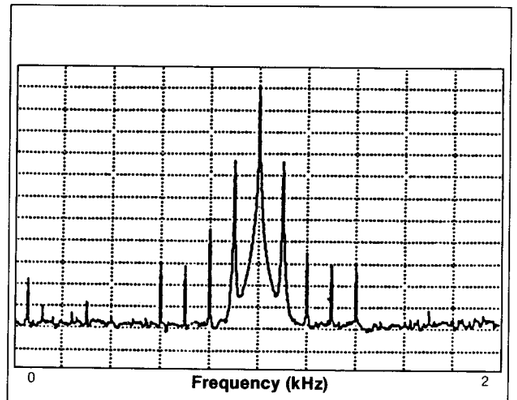
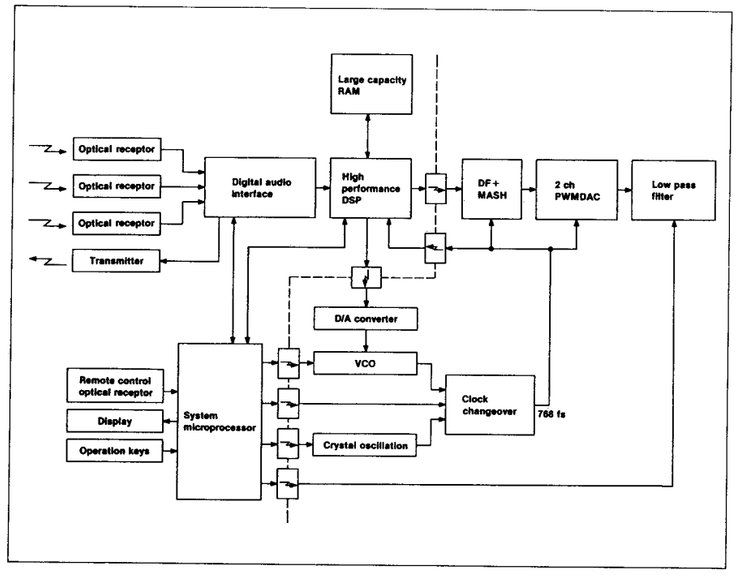


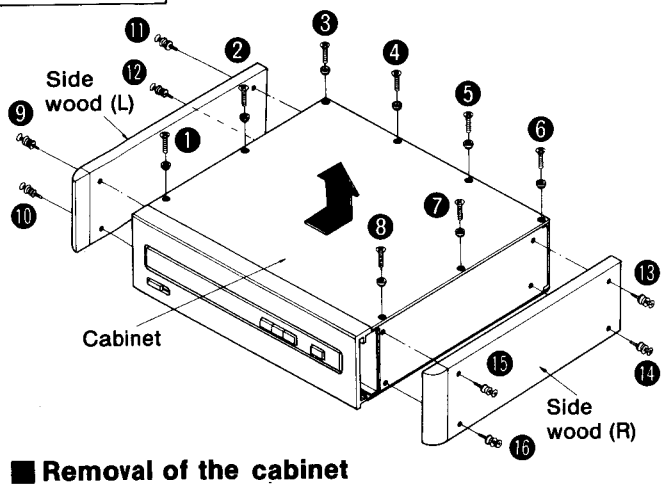
Fig. 5 Conventional PLL audio output spectrogram
(With 100 Hz disturbance in 1 kHz signal)

• BLOCK DIAGRAM



■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1	Removal of the cabinet and side wood (L), (R)
Procedure 1	



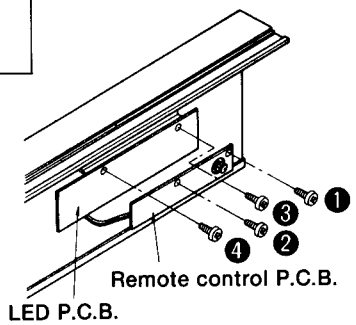
■ Removal of the cabinet

1. Remove the 8 screws (❶~❽).
2. Remove the cabinet in the direction of the arrow.

■ Removal of the side wood (L), (R)

- Remove the 8 screws (❾~⓰).

Ref. No. 3	Removal of the remote control P.C.B. and LED P.C.B.
Procedure 1→2→3	



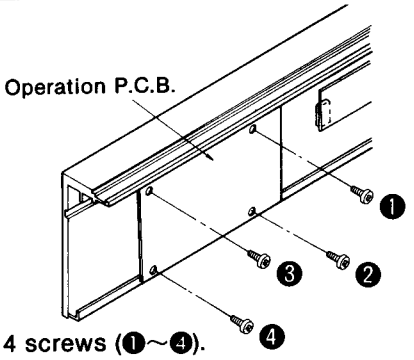
■ Removal of the remote control P.C.B.

- Remove the 2 screws (❶, ❷).

■ Removal of the LED P.C.B.

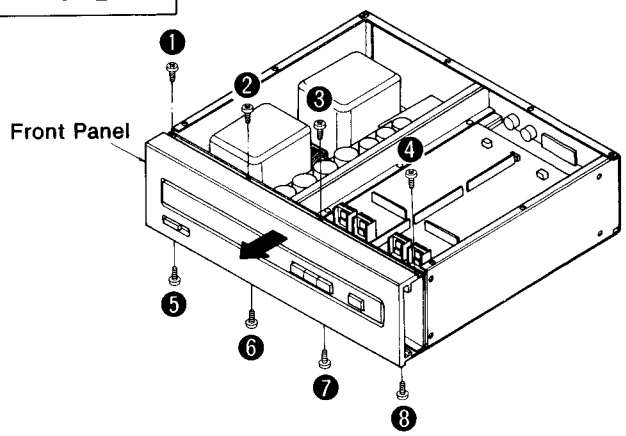
- Remove the 2 screws (❸, ❹).

Ref. No. 4	Removal of the operation P.C.B.
Procedure 1→2→4	

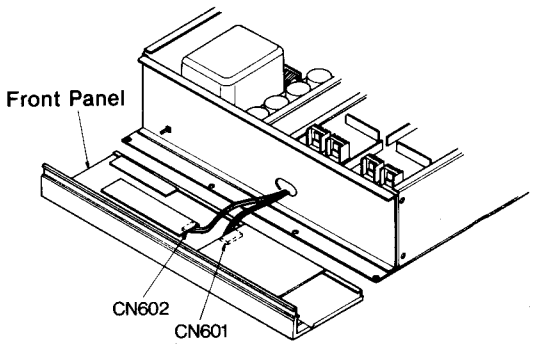


- Remove the 4 screws (❶~❹).

Ref. No. 2	Removal of the front panel
Procedure 1→2	

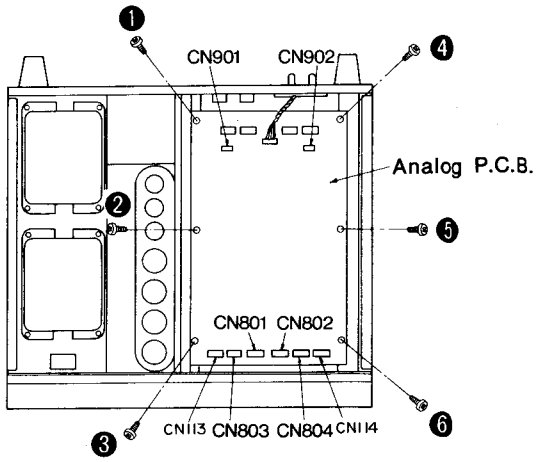


1. Remove the 8 screws (❶~❽).
2. Remove the front panel in the direction of the arrow.



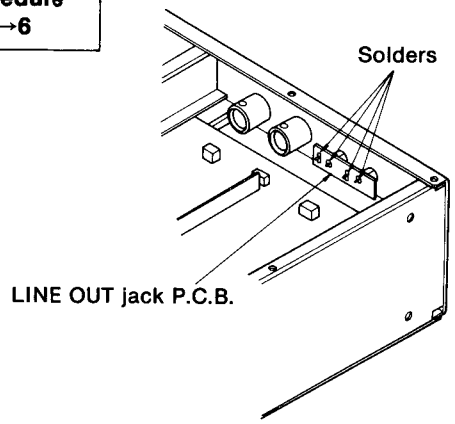
3. Remove the 2 connectors (CN601, CN602).

Ref. No. 5	Removal of the analog P.C.B.
Procedure 1→5	



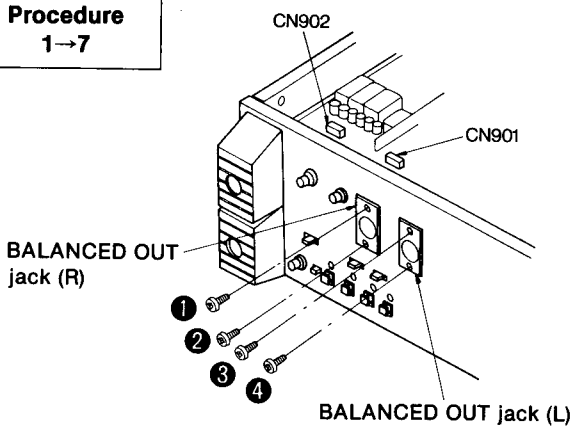
1. Remove the 6 screws (❶~❻).
2. Remove the 8 connectors (CN801, CN802, CN803, CN804, CN113, CN114, CN901, CN902).

Ref. No. 6	Removal of the LINE OUT jack P.C.B.
Procedure 1→6	



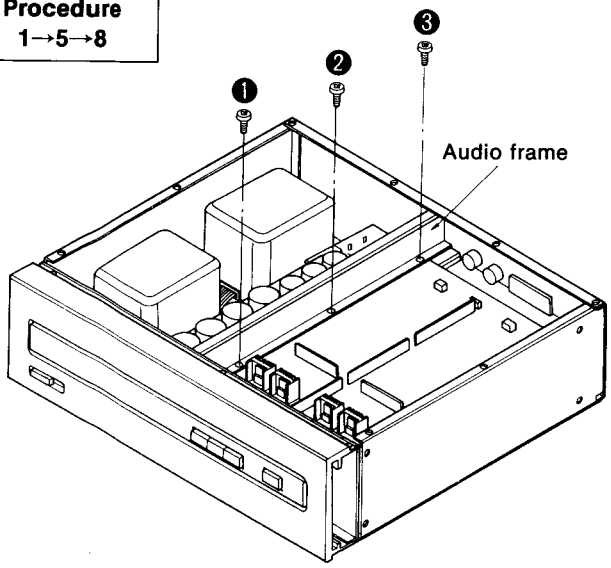
• Unsolder the 4 terminals of the LINE OUT jack P.C.B.

Ref. No. 7	Removal of the BALANCED OUT jack (L), (R)
Procedure 1→7	



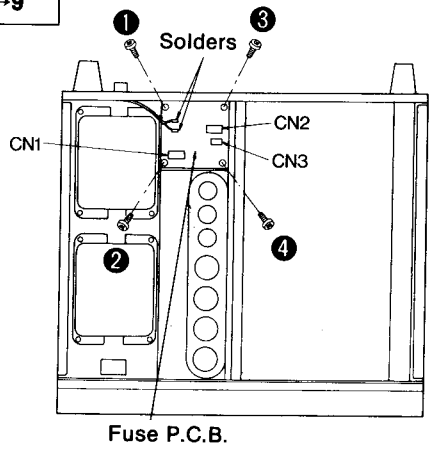
1. Remove the 4 screws (❶~❹).
2. Remove the 2 connectors (CN901, CN902).

Ref. No. 8	Removal of the audio frame
Procedure 1→5→8	



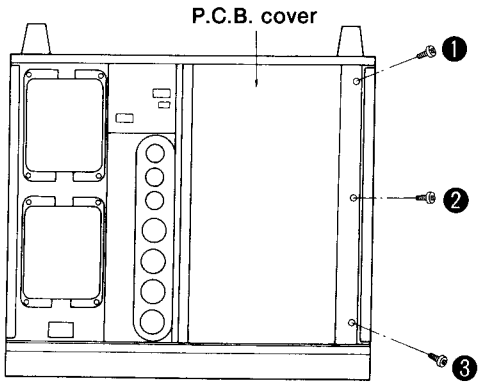
• Remove the 3 screws (❶~❸).

Ref. No. 9	Removal of the fuse P.C.B.
Procedure 1→5→8→9	



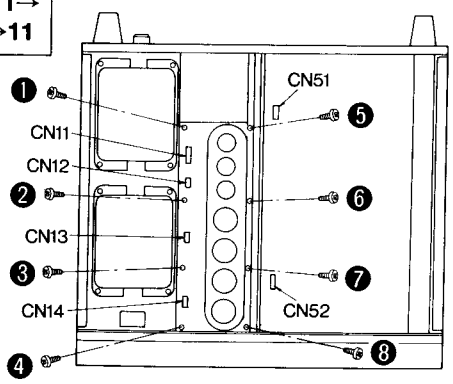
1. Remove the 4 screws (❶~❹).
2. Remove the 3 connectors (CN1, CN2, CN3).
3. Unsolder the 2 terminals of the fuse P.C.B.

Ref. No. 10	Removal of the P.C.B cover
Procedure 1→5→8→10	



• Remove the 3 screws (❶~❸).

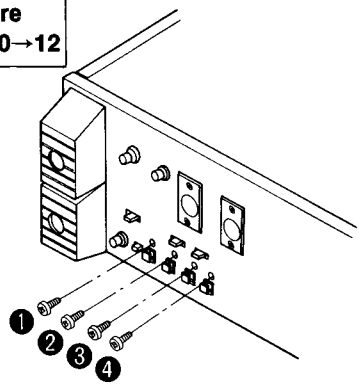
Ref. No. 11	Removal of the power supply P.C.B.
Procedure 1→5→8→10→11	



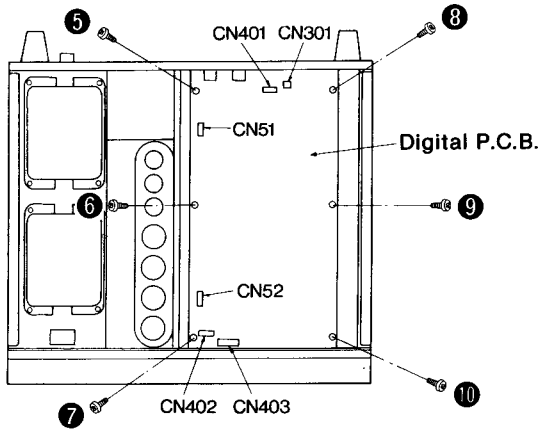
1. Remove the 8 screws (❶~❽).
2. Remove the 6 connectors (CN11, CN12, CN13, CN14, CN51, CN52).

Ref. No. 12	Removal of the digital P.C.B.

Procedure
1→5→8→10→12



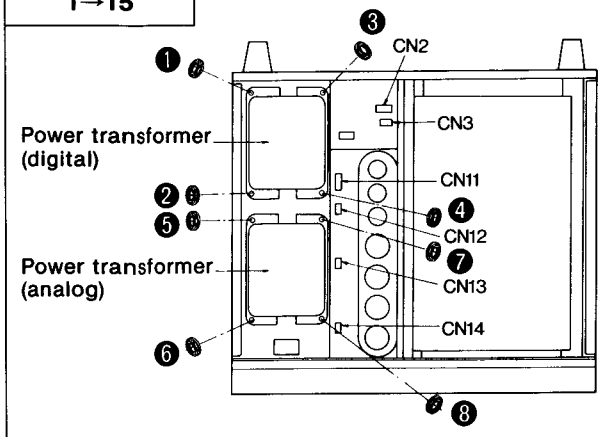
1. Remove the 4 screws (❶~❹).



2. Remove the 6 connectors (CN51, CN52, CN301, CN401, CN402, CN403)
3. Remove the 6 screws (❺~❿).

Ref. No. 15	Removal of the power transformer (digital), (analog)

Procedure
1→15



■ Removal of the power transformer (digital)

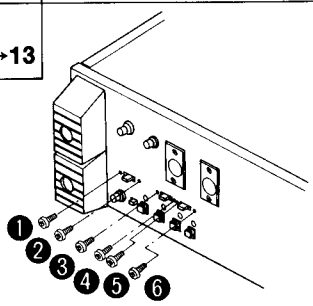
1. Remove the 4 nuts (❶~❹).
2. Remove the 2 connectors (CN2, CN11).

■ Removal of the power transformer (analog)

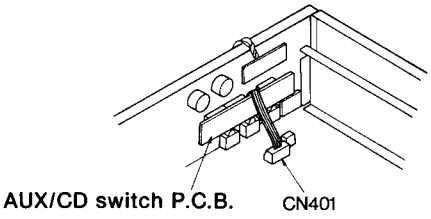
1. Remove the 4 nuts (❺~❽).
2. Remove the 4 connectors (CN3, CN12, CN13, CN14).

Ref. No. 13	Removal of the AUX/CD switch P.C.B.

Procedure
1→5→8→10→13



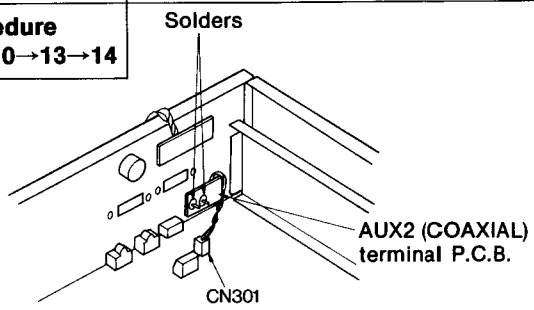
1. Remove the 6 screws (❶~❻).



2. Remove the 1 connector (CN401).

Ref. No. 14	Removal of the AUX2 (COAXIAL) terminal P.C.B.

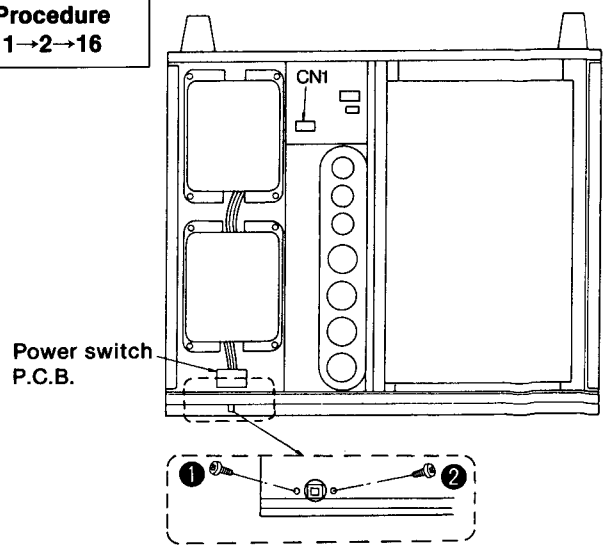
Procedure
1→5→8→10→13→14



1. Unsolder the 2 terminals of the AUX2 (COAXIAL) terminal P.C.B.
2. Remove the 1 connector (CN301).

Ref. No. 16	Removal of the power switch P.C.B.

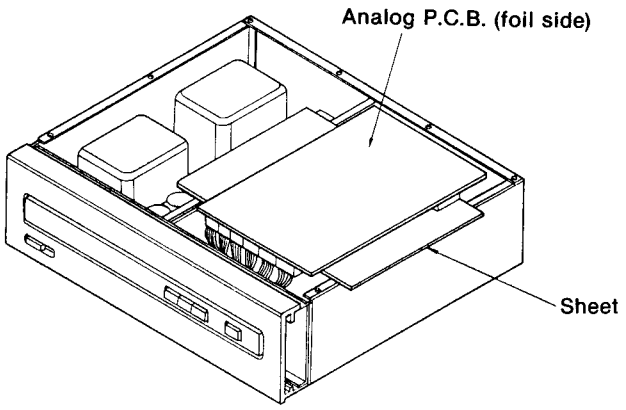
Procedure
1→2→16



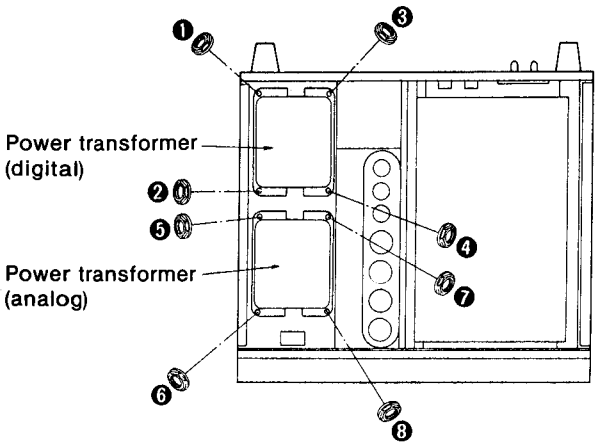
1. Remove the 1 connector (CN1).
2. Remove the 2 screws (❶, ❷).

Ref. No. 17	How to check the analog P.C.B.
Procedure 1→5→17	

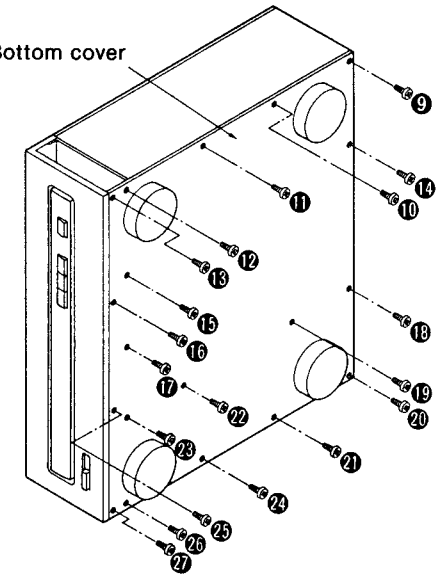
1. When checking the soldered surface and replacing the parts, do as shown.



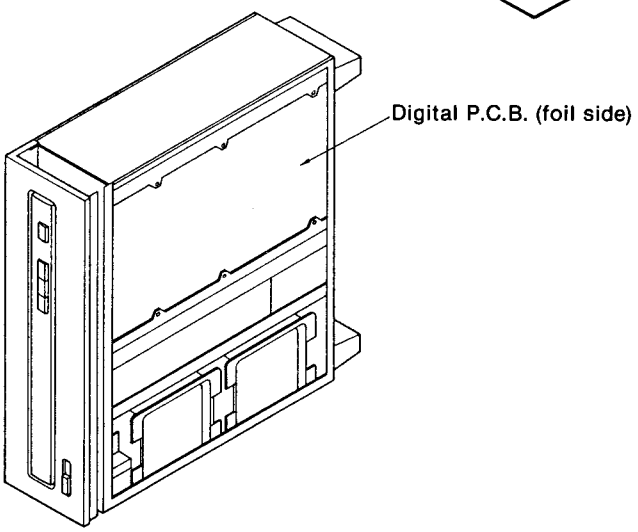
Ref. No. 18	How to check the digital P.C.B.
Procedure 1→18	



1. Remove the 8 nuts (❶~❽).



2. Remove the 19 screws (❾~㉗).
3. Remove the bottom cover.



4. When checking the soldered surface and replacing the parts, do as shown.

■TERMINAL FUNCTION OF IC'S

• IC309 (MB86224PKA): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	TST 1	I	LSI test input (connected to GND)
2	VSS	—	GND terminal
3	$\overline{\text{XRST}}$	I	Reset input
4	TST 2	I	LSI test input (connected to GND)
5	SDA	I/O	Control serial I/F serial data signal
6	PAG	O	General application port
7	$\overline{\text{XAK}}$	O	External interrupt acknowledge signal
8	$\overline{\text{XIT}}$	I	External interrupt request signal
9	SCL	I/O	Control serial I/F serial clock signal
10	WSO 1	I	Data serial I/F transmission word select signal (CH1)
11	SCO 1	I	Data serial I/F transmission clock signal (CH1)
12	VSS	—	GND terminal
13	SDO 1	O	Data serial I/F transmission data signal (CH1)
14	OMS 1	I	Data serial I/F transmission mode change (CH1) (Not used, connected to power supply)
15	WSI 1	I	Data serial I/F receipt word select signal (CH1)
16	SCI 1	I	Data serial I/F receipt clock signal (CH1)
17	SDI 1	I	Data serial I/F receipt data signal (CH1)
18 ∫ 20	MDO ∫ MD 2	I/O	Extension data RAM data bass
21	IMS 1	I	Data serial I/F receipt mode change (CH1) (Not used, connected to power supply)
22	MD 3	I/O	Extension data RAM data bass
23	VSS	—	GND terminal
24 ∫ 32	MD 4 ∫ MD 12	I/O	Extension data RAM data bass
33	VDD	I	Power supply terminal
34 ∫ 41	MD 13 ∫ MD 20	I/O	Extension data RAM data bass
42	VSS	—	GND terminal
43	MD 21	I/O	Extension data RAM data bass
44	WSO 2	I	Data serial I/F transmission word selector signal (CH2)
45	MD 22	I/O	Extension data RAM data bass
46	MD 23		
47	SCO 2	I	Data serial I/F transmission clock signal (CH2)
48	SDO 2	O	Data serial I/F transmission data signal
49	OMS 2	I	Data serial I/F transmission mode change (CH2) (Not used, connected to power supply)
50	WSI 2	I	Data serial I/F receipt word select signal (CH2) (Not used, connected to GND)
51	SCI 2	I	Data serial I/F receipt clock signal (CH2) (Not used, connected to GND)
52	VSS	—	GND terminal
53	XF 0	I	External flag input
54	XF 1		
55	SDI 2	I	Data serial I/F receipt data signal (CH2) (Not used, connected to GND)
56	$\overline{\text{XRDY}}$	I	Extension data RAM ready signal
57	$\overline{\text{XAS}}$	O	Extension RAM address strobe control
58	RXW	O	Extension RAM read, write control
59	EA 0	O	Extension data RAM address
60	EA 1		
61	IMS 2	I	Data serial I/F receipt mode change (CH2) (Not used, connected to power supply)
62	EA 2	O	Extension data RAM address
63	VSS	—	GND terminal
64 ∫ 72	EA 3 ∫ EA 11	O	Extension data RAM address
73	VDD	I	Power supply terminal
74 ∫ 77	EA 12 ∫ EA 15	O	Extension data RAM address
78	SCKO	O	Internal system clock outupt
79	RDYE	I	XRDY enable signal
80	MCLK	I	Master clock input

• IC310 (MB86201): DRAM controller

Pin No.	Mark	I/O Division	Function
1 ⟆ 3	A2 • A6 • A1	O	DRAM address output terminal
4	RDYC 0	I	DSP weight select input terminal
5	RDYC 1		
6	VSS	—	GND terminal
7	PAG	I	Page change signal input Low=page 0, High=page 1
8	XRDY	O	Ready output terminal back to DSP Low=busy condition
9	XRSO	O	RAS signal output (Page 0) Low=enable
10	AO	O	DRAM address output terminal
11	XWE	O	WE signal output terminal Low=enable
12	XCAS	O	CAS signal output terminal Low=enable
13	XOE	O	OE signal output terminal Low=enable
14	XRS 1	O	RAS signal output (Page 1) Low=enable
15	MOD	I	Reflesh action select signal input terminal
16	FSIN		
17	XTLI	I	Crystal terminal

Pin No.	Mark	I/O Division	Function
18	VSS	—	GND terminal
19	VDD	I	Power supply terminal
20	XTL 0	O	Crystal terminal
21	MCLKO	O	Internal independent oscillator output
22	MCLK	I	Master clock signal input (13.333MHz)
23	SCLK	I	System clock signal input (13.333MHz)
24 ⟆ 30	EA 15 ⟆ EA 9	I	Address input terminal
31	VSS	—	GND terminal
32 ⟆ 40	EA 8 ⟆ EA 0	I	Address input terminal
41	RXW	I	Read/write signal input High=read Low=write
42	VSS	—	GND terminal
43	VDD	I	Power supply terminal
44	XAS	I	Address strobe signal input Low=enable
45 ⟆ 48	A7 • A4 • A3 • A5	O	DRAM address output terminal

• IC401 (MB88724BPJX1): System control

Pin No.	Mark	I/O Division	Function
1	$\overline{\text{XTLM}}$ • 80	O	Crystal oscillator control signal output
2	$\overline{\text{XTLH}}$ • 81		
3	XTL/PLL1 • 82		
4	XTL/PLL2 • 83		
5	$\overline{\text{RST}}$ • 90	O	Reset signal output
6	MLD • 91	O	Data output (command load)
7	MCLK • 92	O	Data clock output (command clock)
8	MDATA • 93	O	Data output (command data)
9	$\overline{\text{DSP RST}}$ • 20	O	DSP reset signal output
10	32K • 21	O	LED drive signal output (32kHz)
11	44.1K • 22	O	LED drive signal output (44.1kHz)
12	48K • 23	O	LED drive signal output (48kHz)
13	CD • 30	O	LED drive signal output (CD)
14	AUX 1 • 31	O	LED drive signal output (AUX 1)
15	AUX 2 • 32	O	LED drive signal output (AUX 2)
16	D. BUF • 33	O	LED drive signal output (JITTER FREE)
17	32K • 00	I	32kHz select control input
18	44.1K • 01	I	44.1kHz select control input
19	48K • 02	I	48kHz select control input
20	EMPH • 03	I	Emphasis control signal
21	SDA • 10	I/O	Control serial I/F serial data signal
22	S2 • 11	I	Select signal output
23	S1 • 12		
24	PAG • 13	I	General application port
25	RMC • 40	I	Remote control signal input
26	SCL • 41	I/O	Control serial I/F serial clock signal
27	$\overline{\text{RST}}$ • 42	I	Reset signal input (reset at "L")
28	ERRI • 43	I	Error detection signal (H: error, L: no error)
29	PS/$\overline{\text{PD}}$ • 50	—	(Not used, connected to GND)
30	$\overline{\text{D. EMPH}}$ • 51	—	(Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
31	$\overline{\text{RES}}$	I	Reset signal input (reset at "L")
32	VSS	—	GND terminal
33	X	I/O	Crystal oscillator terminal
34	EX		
35	SE	I	Reset signal input
36	WD	—	GND terminal
37	XL	—	(Not used, open)
38	EXL	I	(Not used, connected to power supply)
39	$\overline{\text{TEST}}$ • 60	I	Test terminal
40	AUX 2 N/W • 61	I	AUX 2 WIDE/NARROW select signal input
41	AUX 1 N/W • 62	I	AUX 1 WIDE/NARROW select signal input
42	CD N/W • 63	I	CD WIDE/NARROW select signal input
43	CD • 70	I	CD key switch control
44	AUX 1 • 71	I	AUX 1 key switch control
45	AUX 2 • 72	I	AUX 2 key switch control
46	D. BF • 73	I	JITTER FREE key switch control
47	VF	I	FL drive power supply terminal (Not used, connected to GND)
48 ∫ 55	A0 ∫ A3 • B0 ∫ B3	—	(Not used, open)
56	POWER • C0	O	LED drive signal output (POWER)
57	C1	—	(Not used, open)
58	EMPH • C2	—	(Not used, open)
59	$\overline{\text{MUTE}}$ • C3	O	Muting signal output
60	D0	—	(Not used, open)
61	$\overline{\text{F0}}$ • D1	O	VCO control signal output
62	$\overline{\text{F1}}$ • D2		
63	$\overline{\text{XTLL}}$ • D3		
64	VCC	I	Power supply terminal

• IC704 (MN64730): Digital filter & MASH

Pin No.	Mark	I/O Division	Function
1	VDD 3	I	Digital power supply terminal
2	FSEL	I	MASH clock change input ("L"=32fs, "H"=64fs)
3	VDD 2	I	Digital power supply terminal
4	BSEL	I	Input data bit change input ("L"=16 bit, "H"=20 bit)
5	ZFLG	O	Digital zero input detection flag output
6	NC	—	Not connected
7	192fs	O	192fs (=8.4672MHz) clock output (Not used, open)
8	LRPOL	I	LRCK polarity change ("H": at Rch data, LRCK: "L")
9	LRCK	I	Serial LR clock input
10	BCLK	I	Serial bit clock input
11	SDATA	I	Serial data input
12	VSS 3	—	Digital GND terminal
13	384fs	O	384fs (=16.9334MHz) clock output
14	MDATA	I	Attenuation command data input
15	MCLK	I	Attenuation command clock input
16	MLD	I	Attenuation command load input
17	RSTB	I	Reset input terminal
18	IE	I	Serial data input format change (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
19	TP 1	O	Test mode output terminal
20	TP 2		
21	TEST 1	I	Test mode input terminal
22	TEST 2		
23	SEL 2	O	L-Rch select signal output (Not used, connected to capacitor)
24	SEL 1		
25	RO 0	O	Rch data signal output
26	NC	—	Not connected
27 ∫ 29	RO 1 ∫ RO 3	O	Rch data signal
30	VSS 1	—	Digital GND terminal
31	X2	O	Crystal oscillator terminal (Not used, open)
32	X1	I	External clock input terminal
33	VDD 1	I	(Not used, connected to capacitor)
34	WCLK	O	L-Rch data output clock signal
35	NC	—	Not connected
36	LO 0	O	Lch data signal
37	NC	—	Not connected
38 ∫ 40	LO 1 ∫ LO 3	O	Lch data signal
41	CSEL	I	Clock input frequency change (L=768fs, H=384fs)
42	VSS 2	—	Digital GND terminal

• IC308 (PD0052): Digital audio interface

Pin No.	Mark	I/O Division	Function
1	IN 1	I	Digital signal input (AUX2)
2	IN 2	I	Digital signal input (AUX1)
3	IN 3	I	Digital signal input (CD)
4	S1	O	Select signal output
5	S2		
6	OUT	O	Digital signal output
7	$\overline{\text{TEST}}$	I	Test terminal
8	$\overline{\text{RESET}}$	I	Reset signal input

Pin No.	Mark	I/O Division	Function
9	VCOINH	—	Not used, connected to GND
10	VSS	—	GND terminal
11	PCVS	I	Connected to resistor
12	PC OUT	O	Connected to resistor
13	R	I	Connected to resistor
14	VCO IN	I	Connected to resistor
15	VDD 1	I	Power supply terminal
16	VCO OUT	O	Not used, open

Pin No.	Mark	I/O Division	Function
17	VSS 1	—	GND terminal
18	CA	I	Connected to capacitor
19	CB		
20	MODE	—	Not used, connected to GND
21	BCK	O	Data serial I/F receipt clock signal (CH1)
22	DATA	O	Data serial I/F receipt data signal (CH1)
23	LRCK	O	Data serial I/F receipt word select signal (CH1)
24	COPY	—	Not used, open

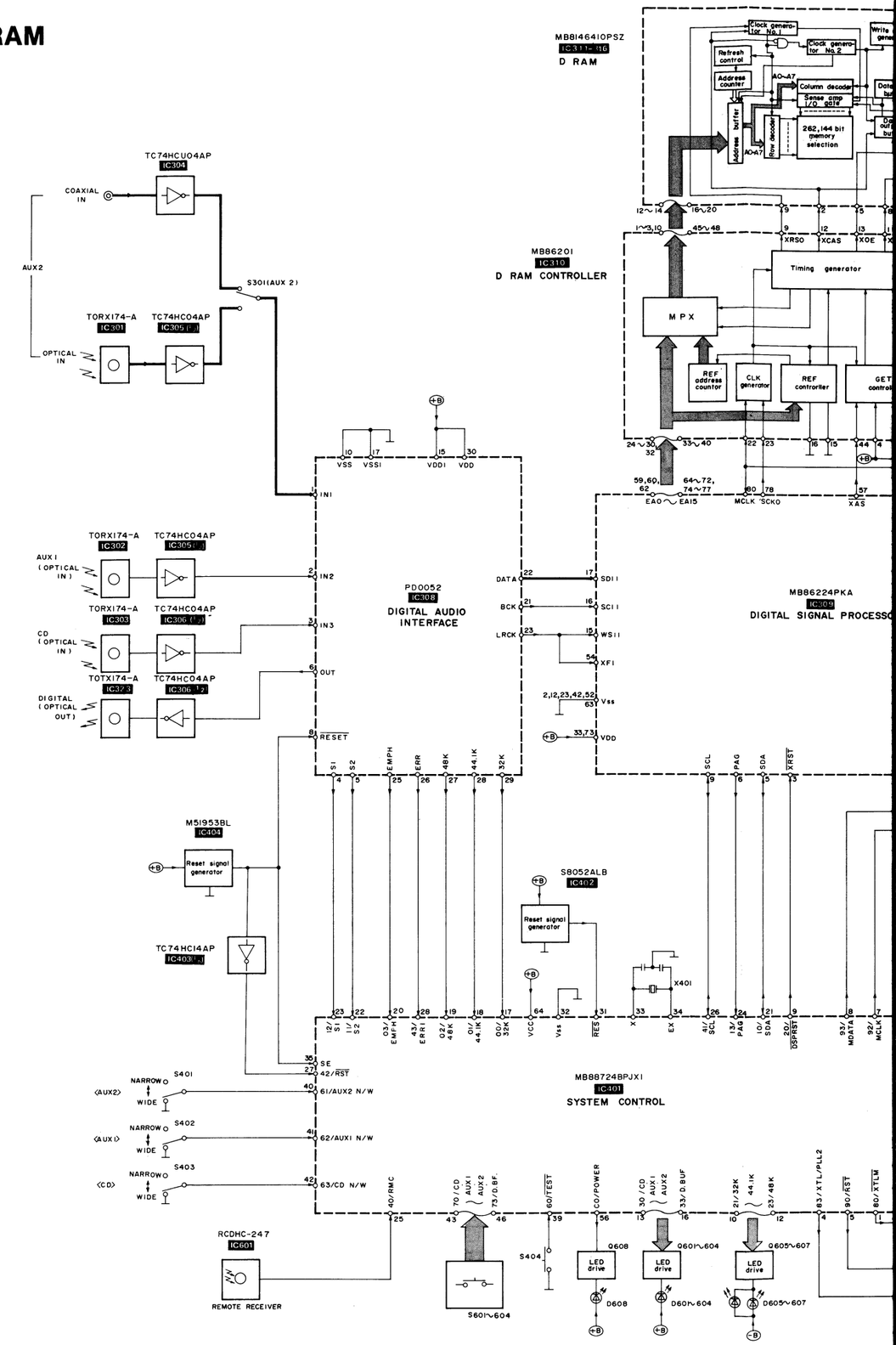
Pin No.	Mark	I/O Division	Function
25	EMPH	O	Emphasis control signal output
26	ERR	O	Error detection signal H: error L: no error
27	48K	O	48kHz select control signal output
28	44.1K	O	44.1kHz select control signal output
29	32K	O	32kHz select control signal output
30	VDD	I	Power supply terminal

• IC705, 706 (MN64731): PWM & D/A converter

Pin No.	Mark	I/O Division	Function
1	DVDD 4	I	Digital power supply terminal
2	DVDD 1		
3	DVSS 1	—	Digital GND terminal
4	XOUT	O	X1 input buffer output (Not used, open)
5	NC	—	Not connected
6	X1	I	External clock input (CSEL="H" at clock input)
7	X2	O	Crystal oscillator terminal (Not used, open)
8	DVSS 2	—	Digital GND terminal
9	DVDD 2	I	Digital power supply terminal
10	CSEL	I	Clock input change (Not used, connected to digital power supply)
11	PSEL	I	PWM mode change (Not used, connected to digital GND)
12	WCLK	I	Data synchronized signal input
13 ∫ 16	D3 ∫ D0	I	Data signal input
17	$\overline{RST}$	I	Reset signal input
18	CLKOUT	O	Clock output (Not used, open)

Pin No.	Mark	I/O Division	Function
19	CLKIN	I	(Not used, connected to digital GND terminal)
20	DVSS 3	—	Digital GND terminal
21	DVDD 3	I	Digital power supply terminal
22	AVDD 2	I	Analog power supply terminal
23 ∫ 28	NC	—	Not connected
29	N1−	O	L1ch/R1ch anti-phase PWM output
30	N1+	O	L1ch/R1ch positive-phase PWM output
31	AVSS 2	—	Analog GND terminal
32	NC	—	Not connected
33	AVSS 1	—	Analog GND terminal
34	P2+	O	L2ch/R2ch positive-phase PWM output
35	P2−	O	L2ch/R2ch anti-phase PWM output
36 ∫ 40	NC	—	Not connected
41	AVDD 1	I	Analog power supply terminal
42	NSUB	I	Sillicone P.C.B. electric potential fixed terminal (Not used, connected to digital power supply)

■ BLOCK DIAGRAM



MB814641OPSZ
IC311~316
D RAM

Clock generator No.1
Clock generator No.2
Write clock generator
Refresh control
Address counter
A0~A7
Column decoder
Sense amp I/O gate
Data input buffer
Address buffer
Row decoder
262,144 bit memory selection
Data output buffer
1,3
6,7
12~14
16~20
9
12
15
8

MB86201
IC310
CONTROLLER

1~3,10
45~48
9 XRSO
12 XCAS
13 XOE
11 XWE
Timing generator
M P X
REF address counter
CLK generator
REF controller
GET controller
24~30, 32
33~40
22
23
16
15
44
4
5
6
41
7
+B
59,60, 62
64~72, 74~77
EA0~EA15
80 MCLK
78 SCKO
57 XAS
56 XRDY
58 RXW
18~20
22,24~41, 43,45,46

MB86224PKA
IC309
DIGITAL SIGNAL PROCESSOR

SDI1 17
SCI1 16
WS1 15
XF1 54
2,12,23,42,52,63 Vss
+B 33,73 VDD
SCL 9
PAG 8
SDA 5
XRST 3
XAK 7
SDO1 13
VSO2 44
SDO2 48
SCO1 11
SCO2 47

S8052ALB
IC312
reset signal generator
+B
64
32
31
Vss
RES
X401
33
34
X
EX
41/ SCL
13/ PAG
10/ SDA
20/ DSPRST
92/ MOSI
92/ MCLK
91/ MLD

MB88724BPJX1
IC101
SYSTEM CONTROL

60/TEST
39
CO/POWER
56
30/CD AUX1
13
33/D.BUF AUX2
16
21/32K
10
44.1K 48K
12
83/XTL/PLL2
4
90/RST
5
80/XTLH
1
82/XTL/PLL1
3
81/XTLL
2
LED drive Q608
D608
LED drive Q601~604
D601~604
LED drive Q605~607
D605~607
+B
-B

D1/F0 61
D2/F1 62
D3/XTLL 63
C3/MUTE 59
Q303
Q302
Q304

HCPL2430
IC701
PHOTO COUPLER
(LRCK) 9
(SDATA) 11
HCPL2630
IC703
PHOTO COUPLER
(MDATA) 14
(MCLK) 15
HCPL2630
IC 13
PHOTO COUPLER
(MLD) 16
(BCLK) 10
HCPL2630
IC514
PHOTO COUPLER
HCPL2400
IC515
PHOTO COUPLER
PS2403-4
IC512
PHOTO COUPLER
PS2403-4
IC511
PHOTO COUPLER
Q509
HCPL2630
IC516
PHOTO COUPLER
TC74HC04AP
IC506 (1/6)

MN64730
IC704
DIGITAL FILTER & MASH
+B
1,3,33 VDD
12,30,42 Vss
S/P converter
F I R
Noise shaping
M A S H
Micro-computer interface
Timing generator
L00 36
L03 38~40
R00 25
R03 27~29
5 (ZFL6)
34 (WCLK)
17 (RST)
13
32
(384fs)
(XI)

MN64731
IC705
PWM DAC
+B
+B
1,2,9,21 DVDD
22,41 AVDD
(WCLK) 12
13
16
(RST) 17
PWM logics
Analog block
Analog block
Timing generator
35
34
30
29
AVSS 31,33
DVSS 8,20,3
6
(XI)
Q701,703
Switching

NJM4580LD
IC707
NJM4580LD
IC708
L.P.F.
NJM4580LD
IC901,903
Class AA balance amp
NJM4580LD
IC805,807
Class AA amp
Q803,RLY803
Relay drive
0805,901
RLY805,901
BALANCED OUT(LCH)
H
C
LCH
LINE OUT

MN64731
IC706
PWM DAC
+B
+B
1,2,9,21 DVDD
22,41 AVDD
(WCLK) 12
13
16
(RST) 17
PWM logics
Analog block
Analog block
Timing generator
35
34
30
29
AVSS 31,33
DVSS 8,20,3
6
(XI)
Q702,704
Switching

NJM4580LD
IC802,804
NJM4580LD
IC708
L.P.F.
NJM4580LD
IC902,904
Class AA balance amp
NJM4580LD
IC806,808
Class AA amp
Q804,RLY804
Relay drive
Q801,802
Muting control
Relay drive
Q806,902
RLY806,902
BALANCED OUT(RCH)
H
C
RCH

PCM56P-J
IC504
D/A CONVERTER
Level shift & control logic
16 bit S/P conver-ter
16 bit latch
16 bit current output & D/A conver-ter
5
7
6
3 VD
16 VA
-VA -VD GND
8 2,12
13
11
10
9
-B

TC74HC86AP,
TC74HC74AP,TC74HC107AP,
TC74HC02AP,
TC74HC393AP
IC317~322
Logical circuit
TC74HC 04AP
IC506 (1/6)
Q301

TC74HC74AP
TC74HC11AP
TC74HC02AP
TC74HC04AP
TC74HC04AP
TC74HC86AP
TC74HC109AP
IC503~508
IC702,715
Q501~511

VCO
FV18M432D300
IC501
Clock selector
X501~503

LM2940T5M
IC51
Regulator
+B
M5F78M05L
IC717
Regulator
M5F78M05L
IC718
Regulator
LM2940T5M
IC52
Regulator
M5F78M06L
IC53
Regulator
M5F79M07L
IC55
Regulator
M5F79M05L
IC54
Regulator
-B
M5F78M05L
IC713
Regulator
M5F78MI2L
IC101
Regulator
NJM4580LD
IC115
Extend active servo
NJM4580LD
IC107
Extend active servo
M5F79MI2L
IC105
Regulator
M5F78M05L
IC714
Regulator
M5F78MI2L
IC102
Regulator
NJM4580LD
IC116
Extend active servo
M5F79MI2L
IC104
Regulator
NJM4580LD
IC108
Extend active servo
D11
D12,13
D14,15
D16,17
T1
T2
Power transformer
Power transformer
F1
F2
S1 (POWER)
L1
L2
AC IN

Note:
• ⟶ Audio signal

■SCHEMATIC DIAGRAM

(Parts list on pages 42～44, 48, 49.)

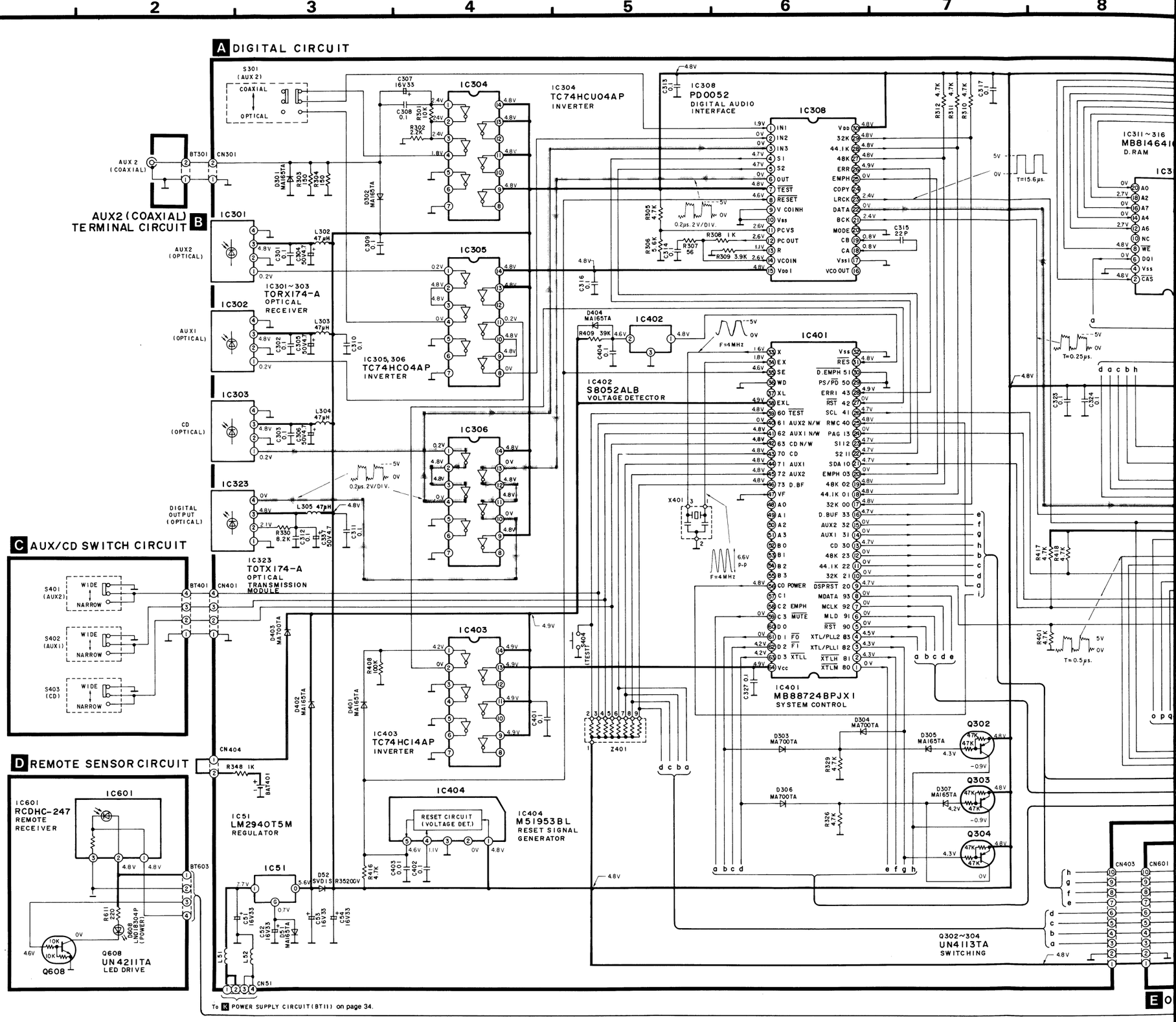
(This schematic diagram may be modified at any time with development of new technology.)

- **S1** : Power switch in **"on"** position.
- **S2** : Voltage selector switch in **"240V"** position.
- **S301** : Digital input selector switch. (COAXIAL↔OPTICAL)
- **S401～403** : WIDE/NARROW changeover switches. (S401: AUX 2, S402: AUX 1, S403: CD)
- **S404** : Test switch.
- **S601～603** : Input selector switches. (S601: CD, S602: aux 1, S603: aux 2)
- **S604** : Jitter free switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Part No.	Original Part No.	Supply Part No.
IC51, 52	LM2940T5M	LM2940T5
IC601	RCDHC-247	RCD0003

- ——— / — — — : Positive voltage lines and negative voltage lines.
- ⋯⋯◈ : Audio signal lines.
- ⋯⋯◈ : Digital signal lines.

Caution!
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.



7 8 9 10 11 12 13 14 15 16 17

IC311~316
MB814641OPSZ
D.RAM

IC311 IC312 IC313 IC314 IC315 IC316

IC320
TC74HC02AP
NOR GATE

IC309
MB86224PKA
DIGITAL SIGNAL PROCESSING

IC310
MB86201
D.RAM CONTROLLER

Frequency adj.
test point

TJ301 TJ302

IC317
TC74HC86AP
EX.OR GATE

Q301
2SC3311AQSTA
SWITCHING

IC318, 321
TC74HC74AP
D.FLIP-FLOP

IC319
TC74HC107AP
J-K FLIP-FLOP

IC322
TC74HC393AP
BINARY UP/DOWN COUNTER

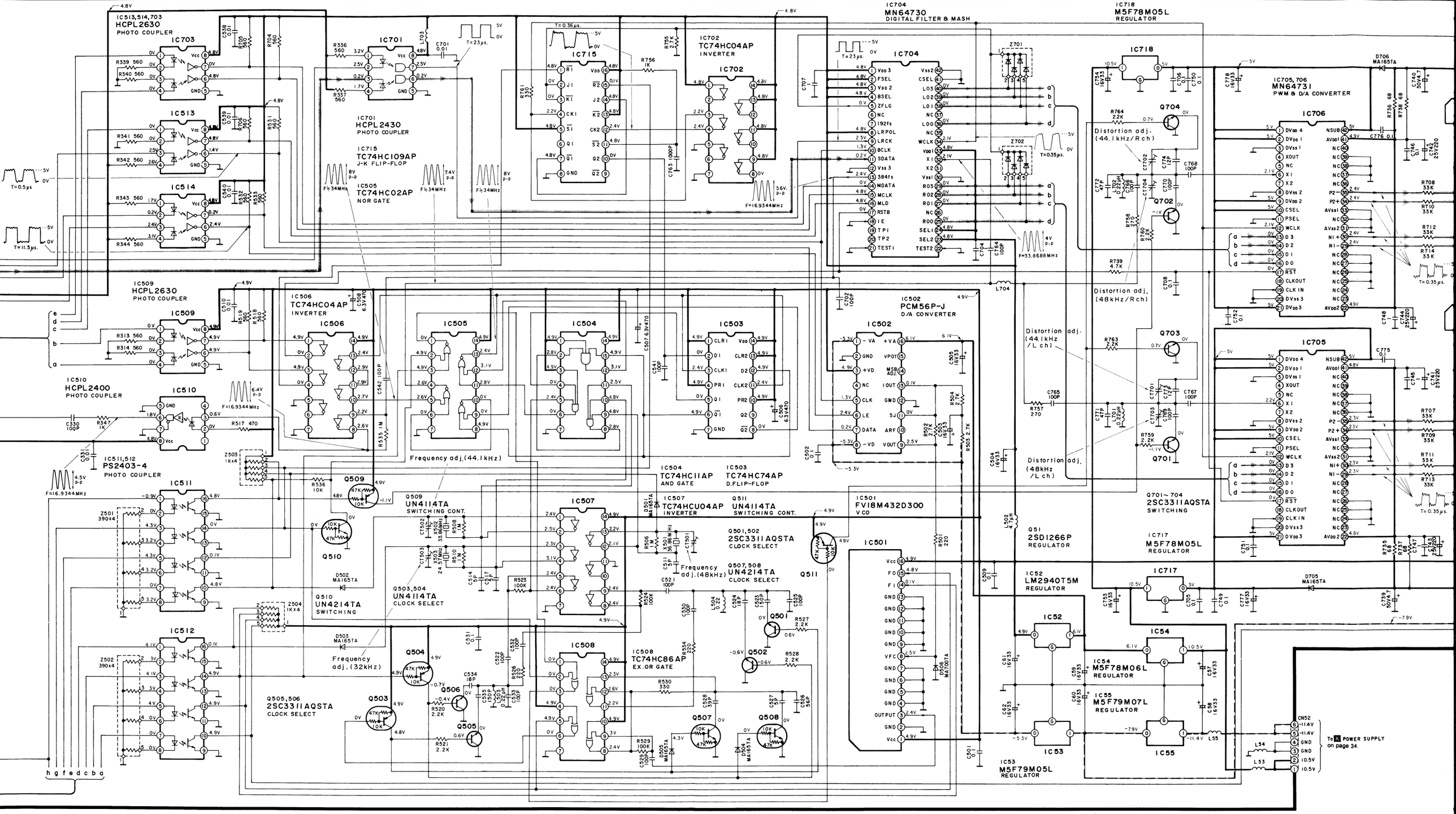
Q302~304
UN4113TA
SWITCHING

Q601~604
UN4211TA
LED DRIVE

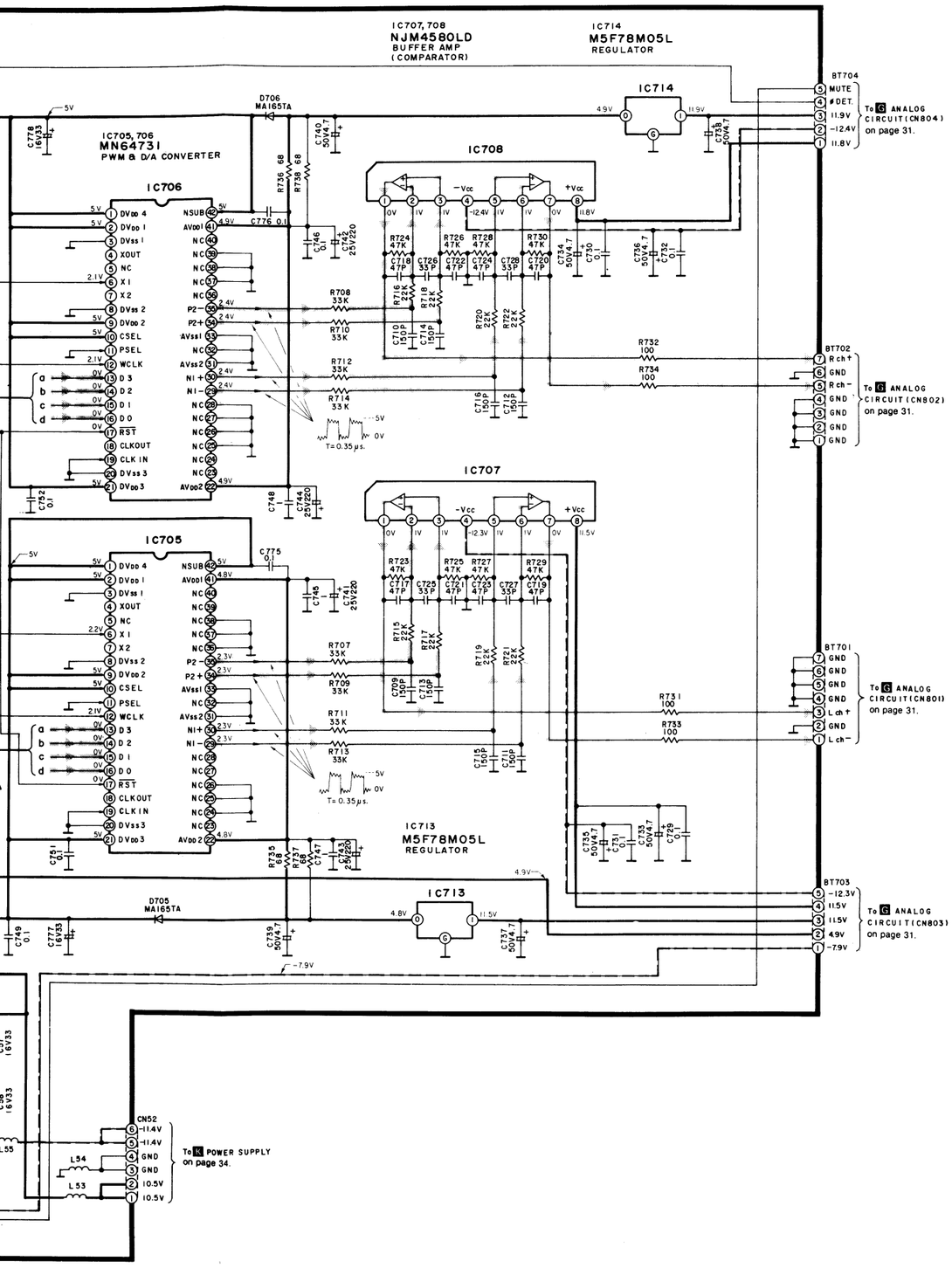
Q605~607
UN4211TA
LED DRIVE

E OPERATION CIRCUIT

F LED CIRCUIT


IC513,514,703
HCPL2630
PHOTO COUPLER
IC703
IC513
IC514
IC701
HCPL2430
PHOTO COUPLER
IC715
TC74HC109AP
J-K FLIP-FLOP
IC505
TC74HC02AP
NOR GATE
IC702
TC74HC04AP
INVERTER
IC704
MN64730
DIGITAL FILTER & MASH
IC718
M5F78M05L
REGULATOR
IC705, 706
MN64731
PWM & D/A CONVERTER
IC706
IC705
IC509
HCPL2630
PHOTO COUPLER
IC509
IC506
TC74HC04AP
INVERTER
IC506
IC505
IC504
IC503
IC502
PCM56P-J
D/A CONVERTER
IC502
IC510
HCPL2400
PHOTO COUPLER
IC510
IC511,512
PS2403-4
PHOTO COUPLER
IC511
IC512
Frequency adj.(44.1kHz)
IC504
TC74HC11AP
AND GATE
IC503
TC74HC74AP
D.FLIP-FLOP
IC507
TC74HCU04AP
INVERTER
IC508
TC74HC86AP
EX.OR GATE
IC501
FVI8M432D300
VCO
Q509
UN4114TA
SWITCHING CONT.
Q510
UN4214TA
SWITCHING
Q503,504
UN4114TA
CLOCK SELECT
Q505,506
2SC3311AQSTA
CLOCK SELECT
Q501,502
2SC3311AQSTA
CLOCK SELECT
Q507,508
UN4214TA
CLOCK SELECT
Q511
UN4114TA
SWITCHING CONT.
Frequency adj.(48kHz)
Frequency adj.(32kHz)
Distortion adj. (44.1kHz/Rch)
Distortion adj. (48kHz/Rch)
Distortion adj. (44.1kHz /Lch)
Distortion adj. (48kHz /Lch)
Q704
Q702
Q703
Q701
Q701~704
2SC3311AQSTA
SWITCHING
Q51
2SD1266P
REGULATOR
IC52
LM2940T5M
REGULATOR
IC717
M5F78M05L
REGULATOR
IC54
M5F78M06L
REGULATOR
IC55
M5F79M07L
REGULATOR
IC53
M5F79M05L
REGULATOR
Z501
Z502
Z503
Z504
To K POWER SUPPLY on page 34.

27 28 29 30 31 32 33 34 35 36



CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ADVARSEL!

Lithimbatteri — Eksplosionsfare ved fejlagtig handtering. Udskiftning má kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverand ø ren.

ADVARSEL

Lithiumbatteri — Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverand ø ren.

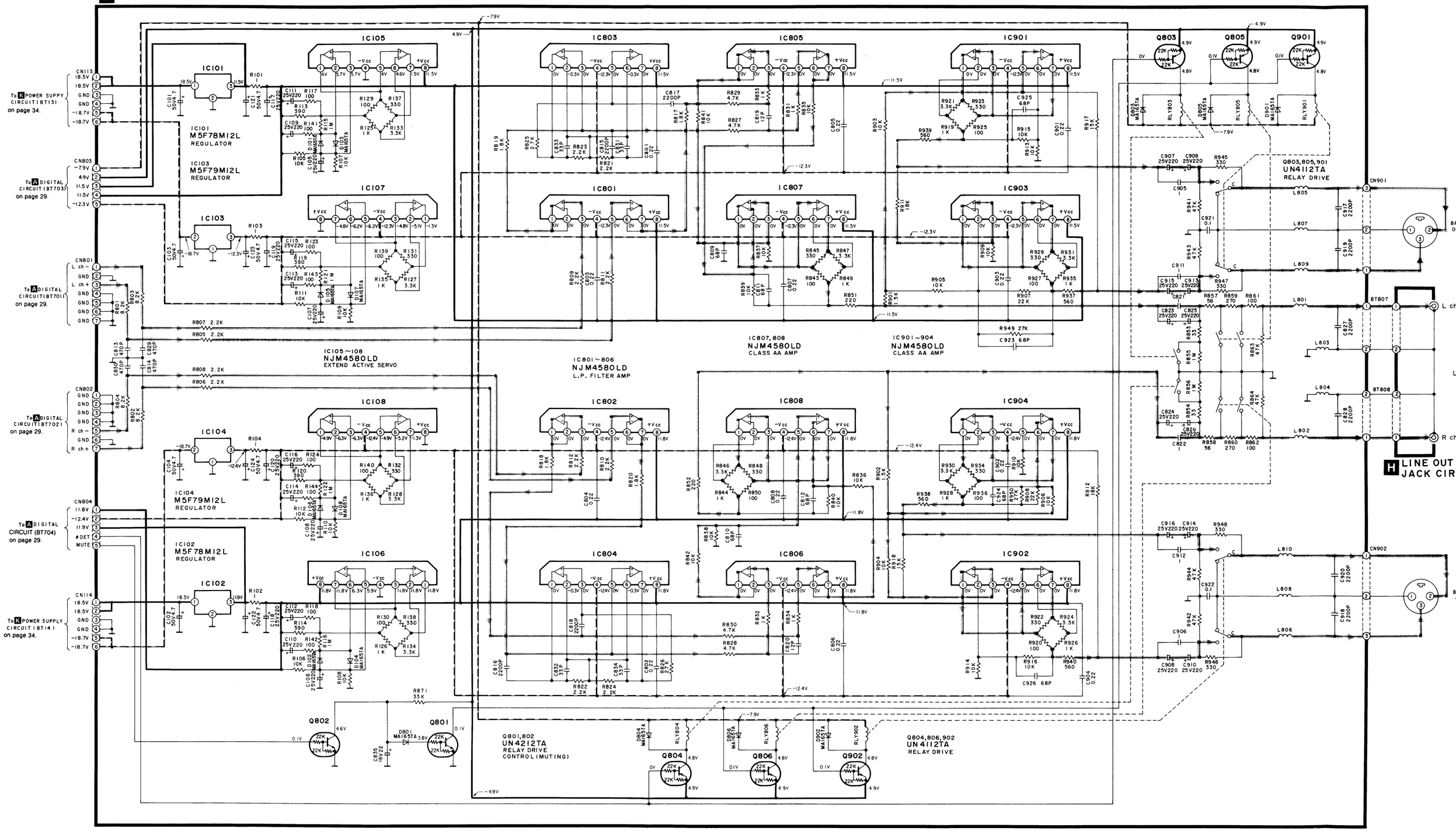
VARNING

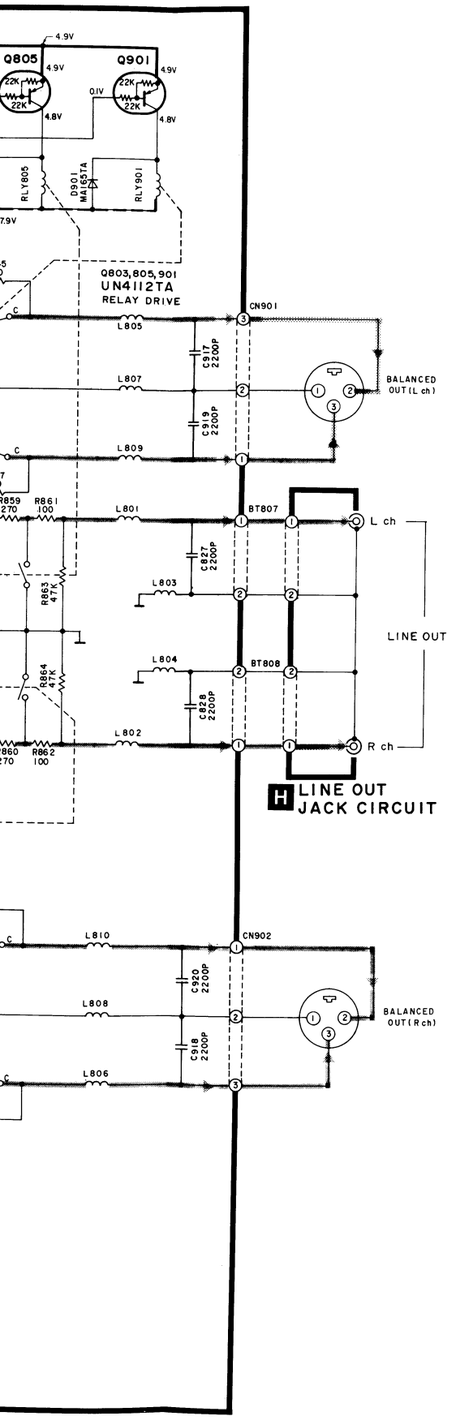
Explosionsfara vid felaktigt batteribyte.
Anvand samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera anvant batteri enligt fabrikantens instruktion.

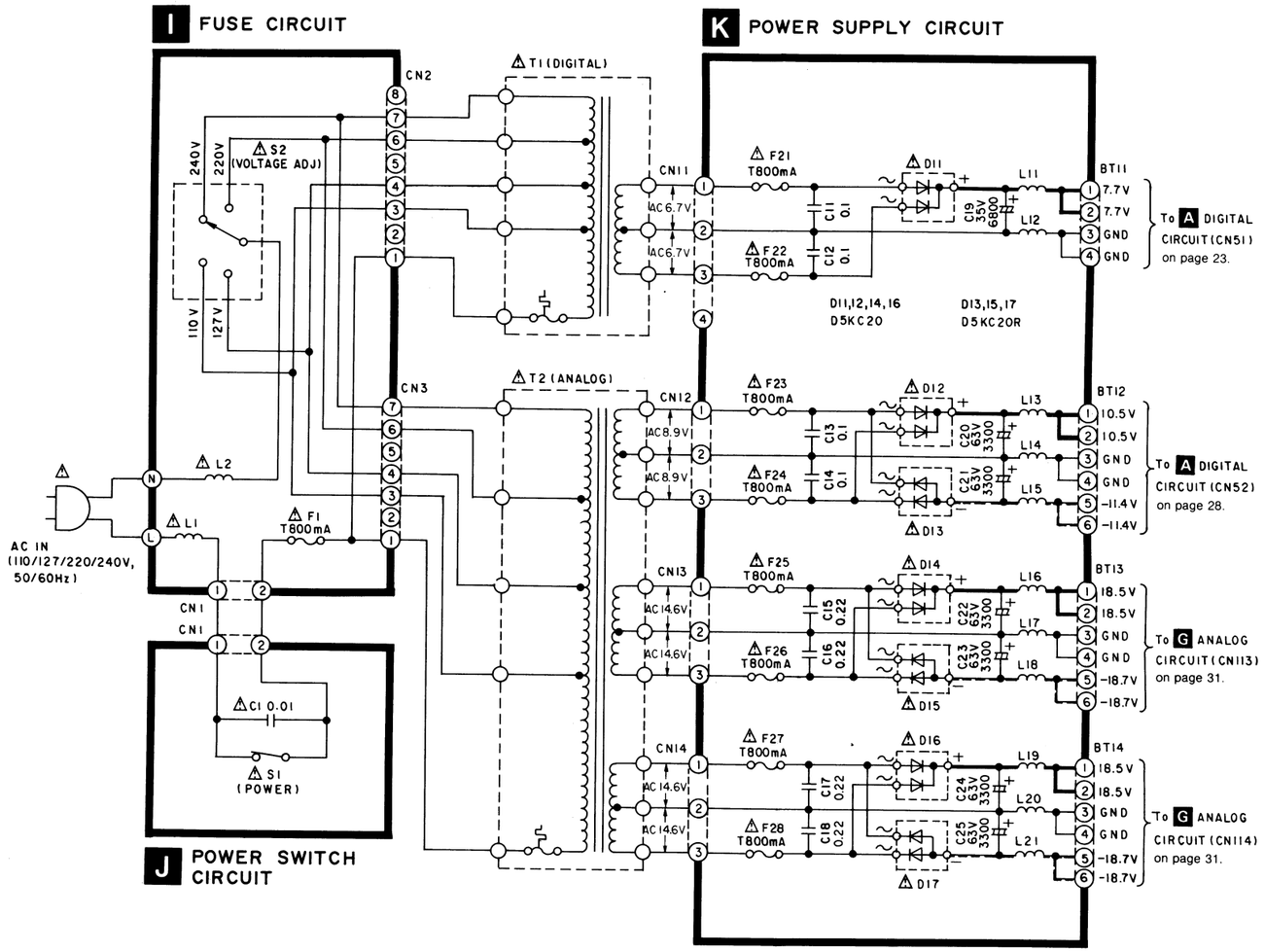
VAROITUS

Paristo voi rajahtaa, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Havita kaytetty paristo valmistajan ohjeiden mukaisesti.

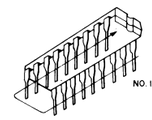
G ANALOG CIRCUIT





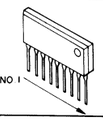


■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

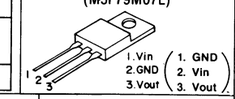


HCPL2630 HCPL2400 HCPL2430	8 Pin
TC74HCU04AP TC74HC04AP TC74HC86AP TC74HC74AP TC74HC107AP TC74HC02AP TC74HC393AP TC74HC14AP TC74HC11AP	14 Pin
PCM56P-J PS2403-4 TC74HC109AP	16 Pin
PD0052	30 Pin
MN64730 MN64731	42 Pin
MB88724BPJX1	64 Pin

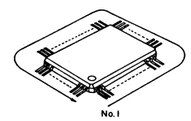
M51953BL	5 Pin
NJM4580LD	8 Pin
FV18M432D300	16 Pin



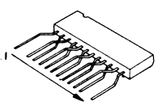
LM2940T5M
(M5F79M12L)
(M5F79M05L)
M5F78M12L
M5F78M05L
M5F78M06L
(M5F79M07L)



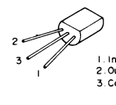
MB86224PKA 80 Pin



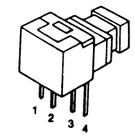
MB8146410PSZ 20 Pin



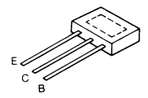
S8052ALB



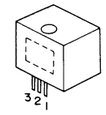
TORX174-A
TOTX174-A



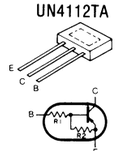
2SC3311AQRS



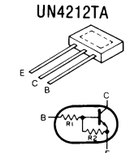
RCDHC-247



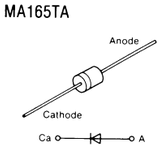
UN4113TA
UN4114TA
UN4112TA



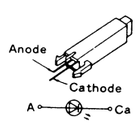
UN4214TA
UN4211TA
UN4212TA



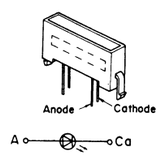
D5KC20 SVD1SR35200V
D5KC20R MA700TA
MA165TA



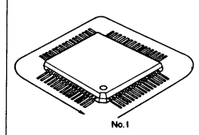
LN014304P
LN018304P



LN023428P

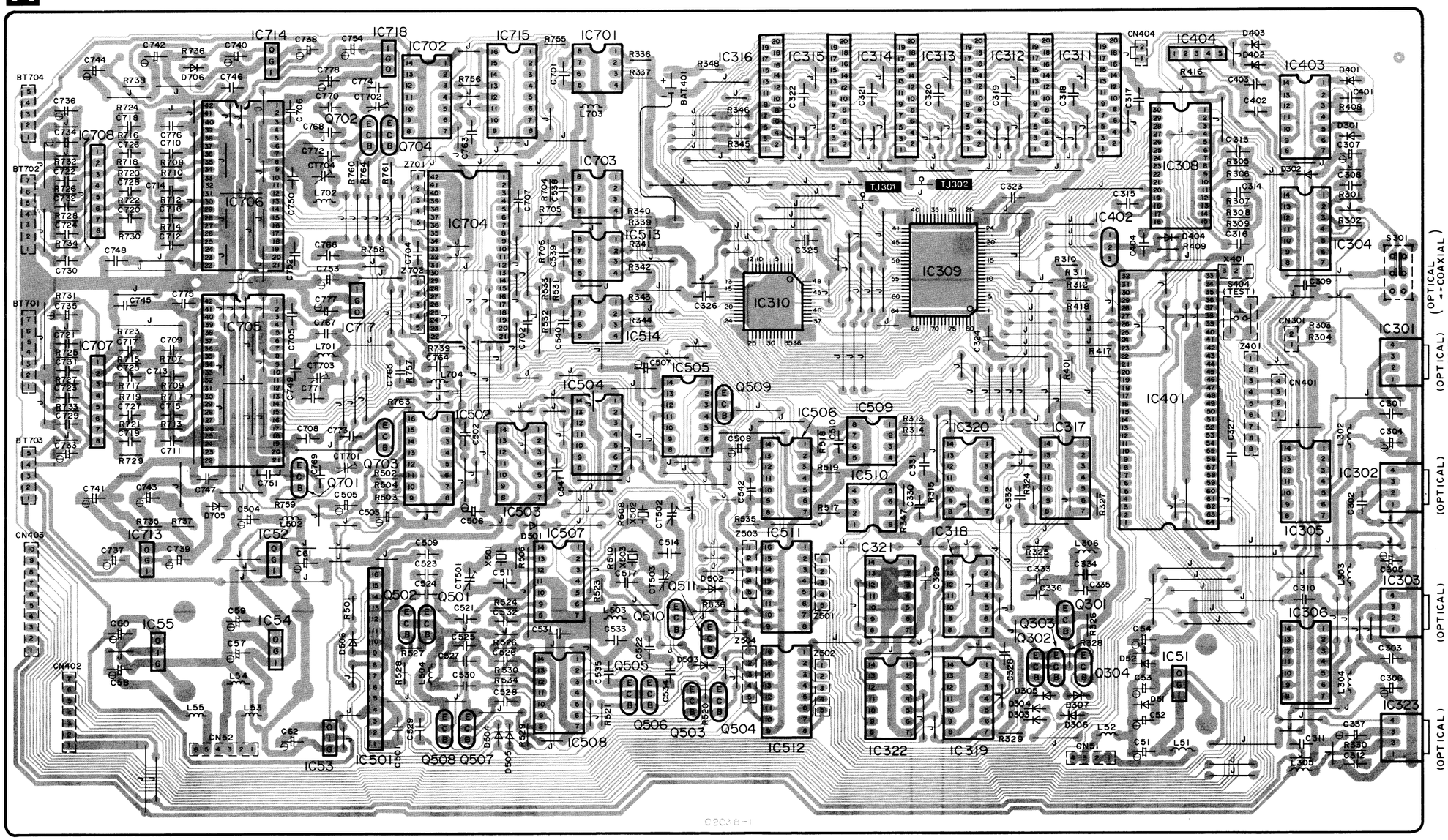


MB86201 48 Pin

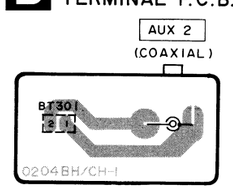


■PRINTED CIRCUIT BOARDS

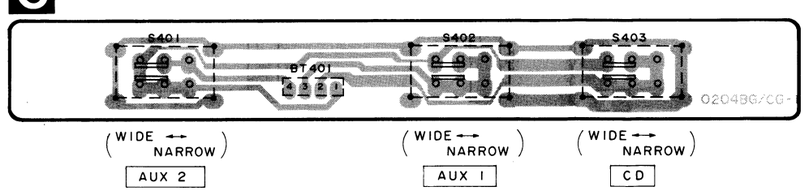
A DIGITAL P. C. B.



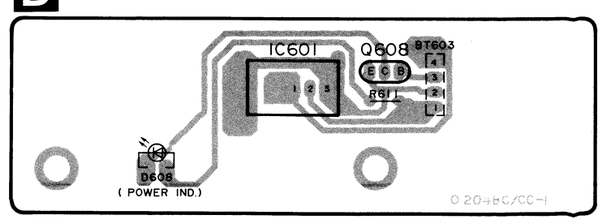
B AUX2(COAXIAL) TERMINAL P.C.B.



C AUX/CD SWITCH P.C.B.

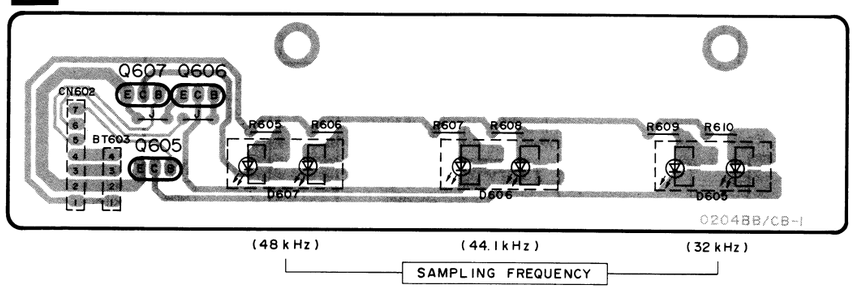


D REMOTE SENSOR P.C.B.

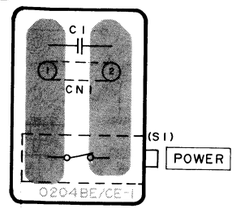


10 11 12 13 14 15 16 17 18 19

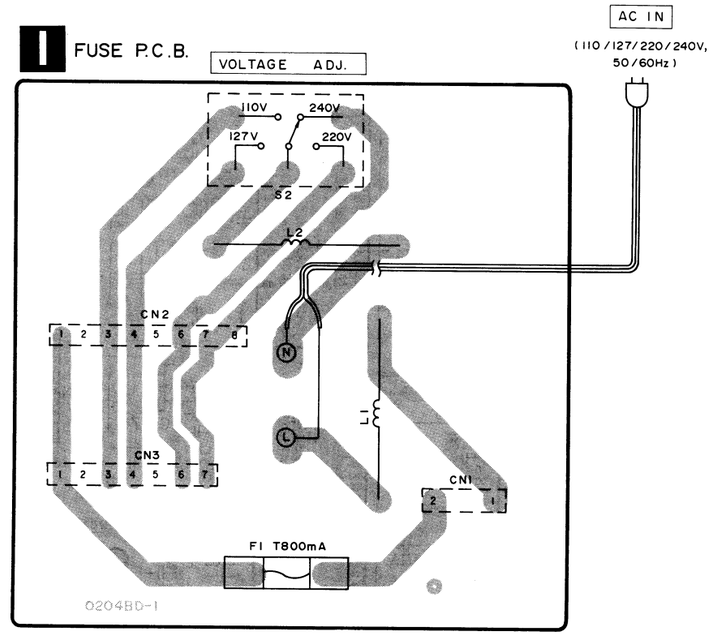
F LED P.C.B.



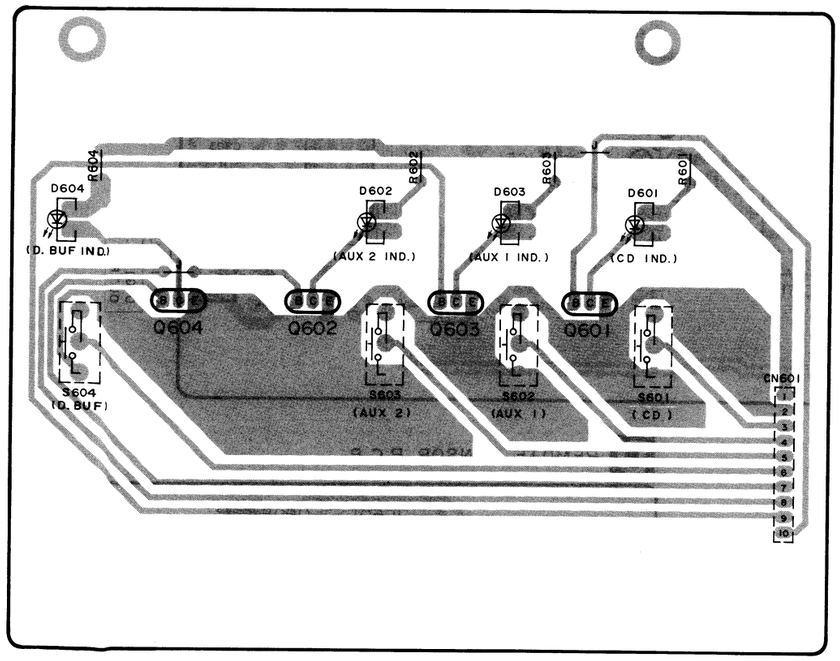
J POWER SWITCH P.C.B.



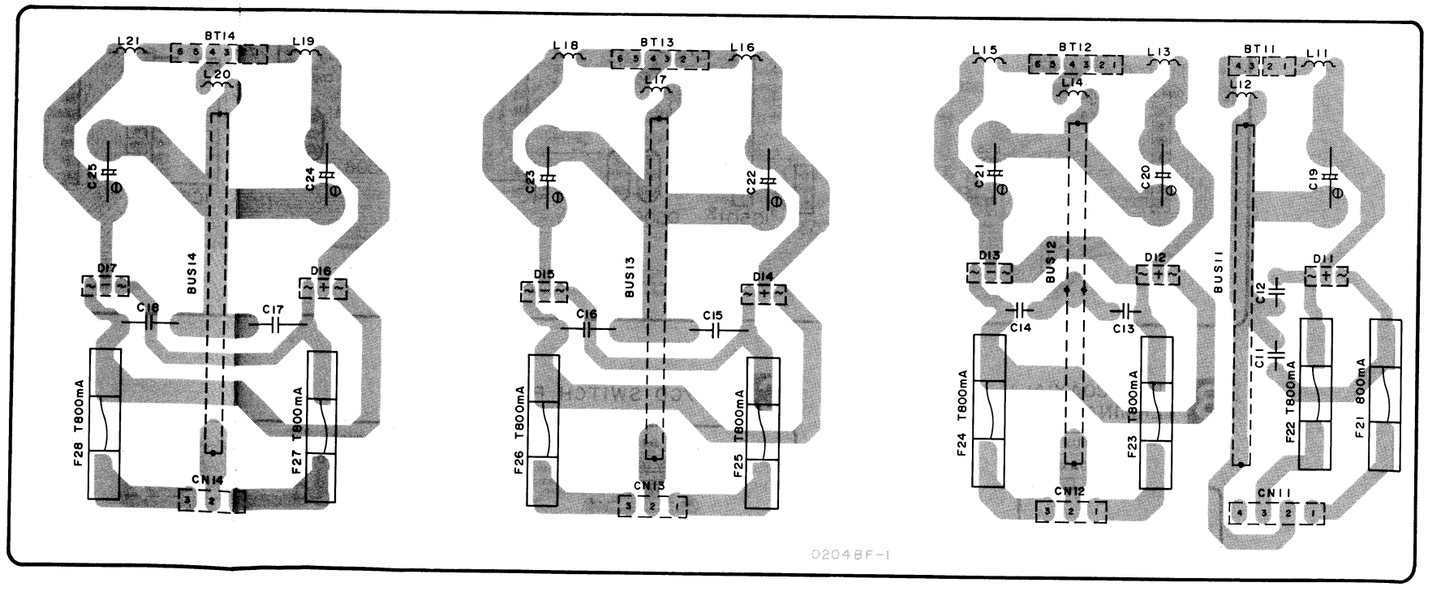
I FUSE P.C.B.



E OPERATION P.C.B.

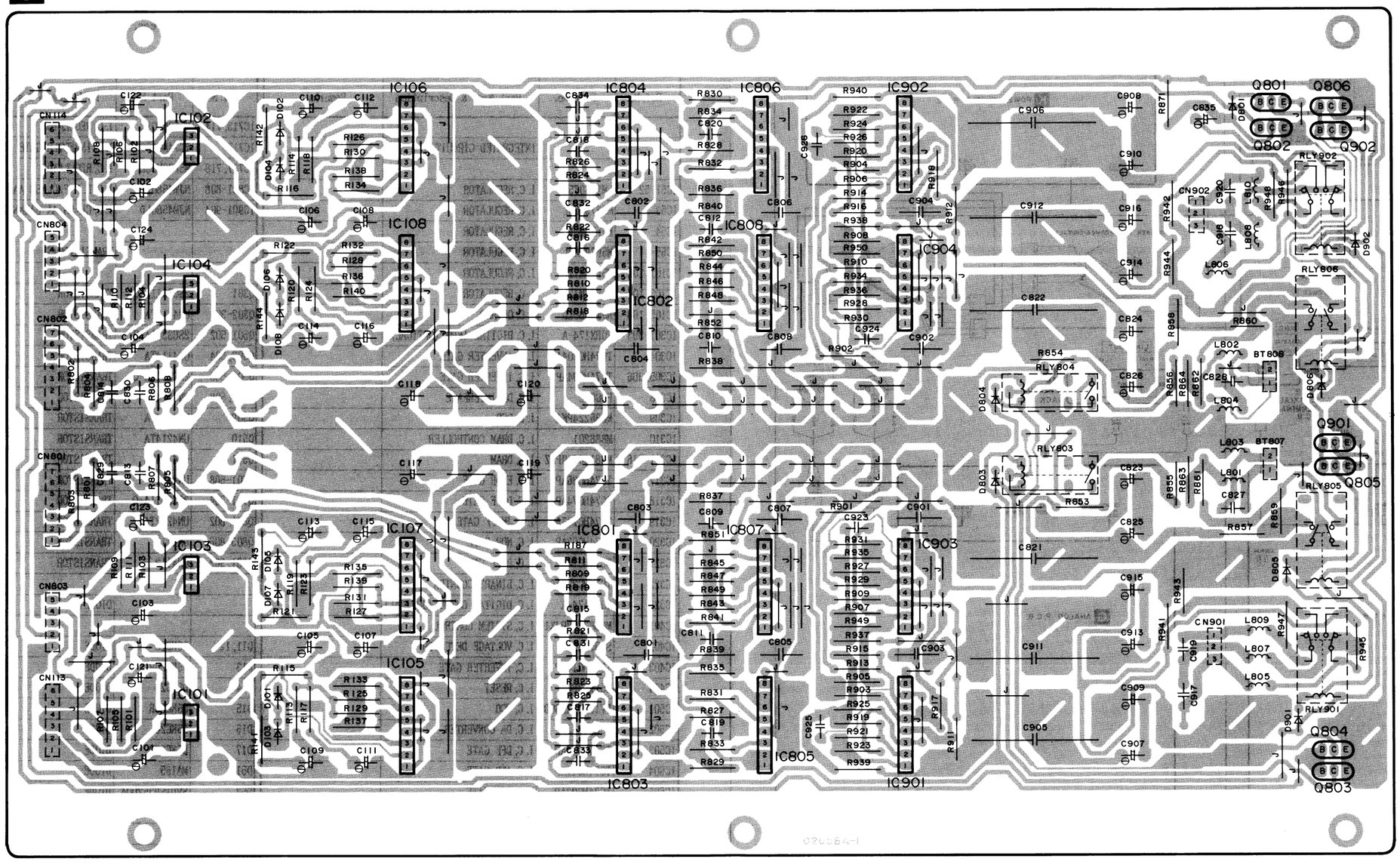


K POWER SUPPLY P.C.B.

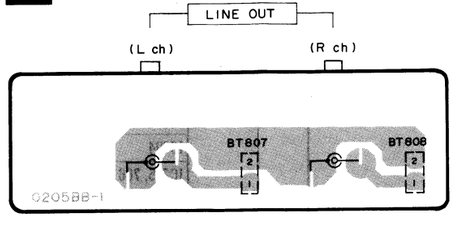


20 21 22 23 24 25 26 27 28

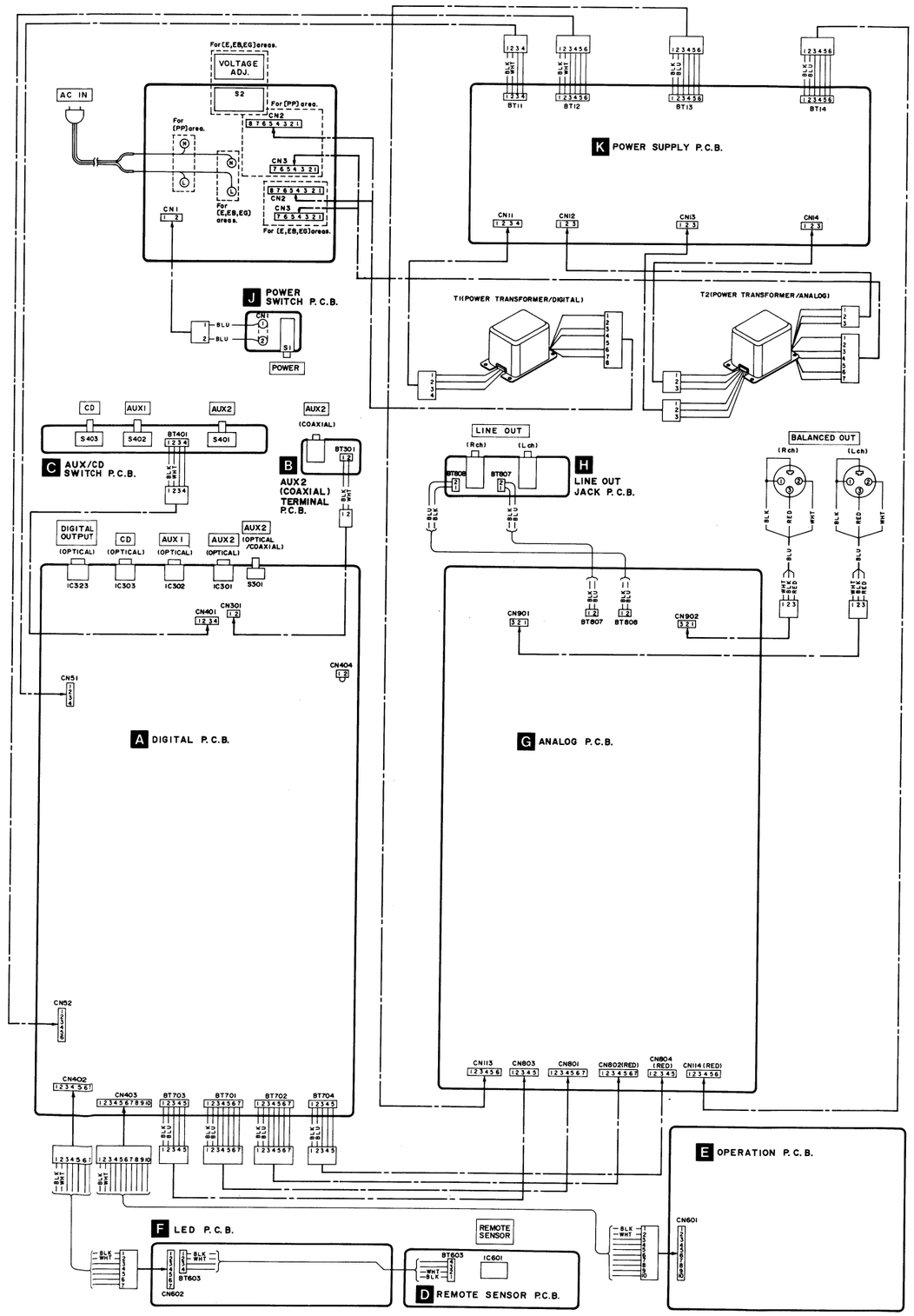
G ANALOG P. C. B.



H LINE OUT JACK P. C. B.



■ WIRING CONNECTION DIAGRAM



■ REPLACEMENT PARTS LIST

Notes : * Important safety notice:
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Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC51, 52	LM2940T5	I. C, REGULATOR	
IC53	M5F79M05L	I. C, REGULATOR	
IC54	M5F78M06L	I. C, REGULATOR	
IC55	M5F79M07L	I. C, REGULATOR	
IC101, 102	M5F78M12L	I. C, REGULATOR	
IC103, 104	M5F79M12L	I. C, REGULATOR	
IC105-108	NJM4580LD	I. C, OP. AMP.	
IC301-303	TORX174-A	I. C, DIGITAL INPUT(OPTICAL)	
IC304	TC74HCU04AP	I. C, INVERTER GATE	
IC305, 306	TC74HC04AP	I. C, INVERTER GATE	
IC308	PD0052	I. C, DA INTERFACE	
IC309	MB86224PKA	I. C, DSP	
IC310	MB86201	I. C, DRAM CONTROLLER	
IC311-316	MB8146410PSZ	I. C, DRAM	
IC317	TC74HC86AP	I. C, EXOR GATE	
IC318	TC74HC74AP	I. C, D FF GATE	
IC319	TC74HC107AP	I. C, JK FF GATE	
IC320	TC74HC02AP	I. C, NOR GATE	
IC321	TC74HC74AP	I. C, D FF GATE	
IC322	TC74HC393AP	I. C, BINARY COUNTER	
IC323	TOTX174-A	I. C, DIGITAL OUTPUT (OPTICAL)	
IC401	MB88724BPJX1	I. C, SYSTEM CONTROL	
IC402	S8052ALB	I. C, VOLTAGE DETECTOR	
IC403	TC74HC14AP	I. C, INVERTER GATE	
IC404	M51953BL	I. C, RESET	
IC501	FV18M432D300	I. C, VCO	
IC502	PCM56P-J	I. C, DA CONVERTER	
IC503	TC74HC74AP	I. C, DFF GATE	
IC504	TC74HC11AP	I. C, AND GATE	
IC505	TC74HC02AP	I. C, NOR GATE	
IC506	TC74HC04AP	I. C, INVERTER GATE	
IC507	TC74HCU04AP	I. C, INVERTER GATE	
IC508	TC74HC86AP	I. C, EXOR GATE	
IC509	HCPL2630	I. C, PHOTO COUPLER	
IC510	HCPL2400	I. C, PHOTO COUPLER	
IC511, 512	PS2403-4	I. C, PHOTO COUPLER	
IC513, 514	HCPL2630	I. C, PHOTO COUPLER	
IC601	RCD0003	I. C, REMOTE RECEIVER	
IC701	HCPL2430	I. C, PHOTO COUPLER	
IC702	TC74HC04AP	I. C, INVERTER GATE	
IC703	HCPL2630	I. C, PHOTO COUPLER	
IC704	MN64730	I. C, DIGITAL FILTER & MASH	
IC705, 706	MN64731	I. C, PWM DAC	
IC707, 708	NJM4580LD	I. C, OP. AMP.	

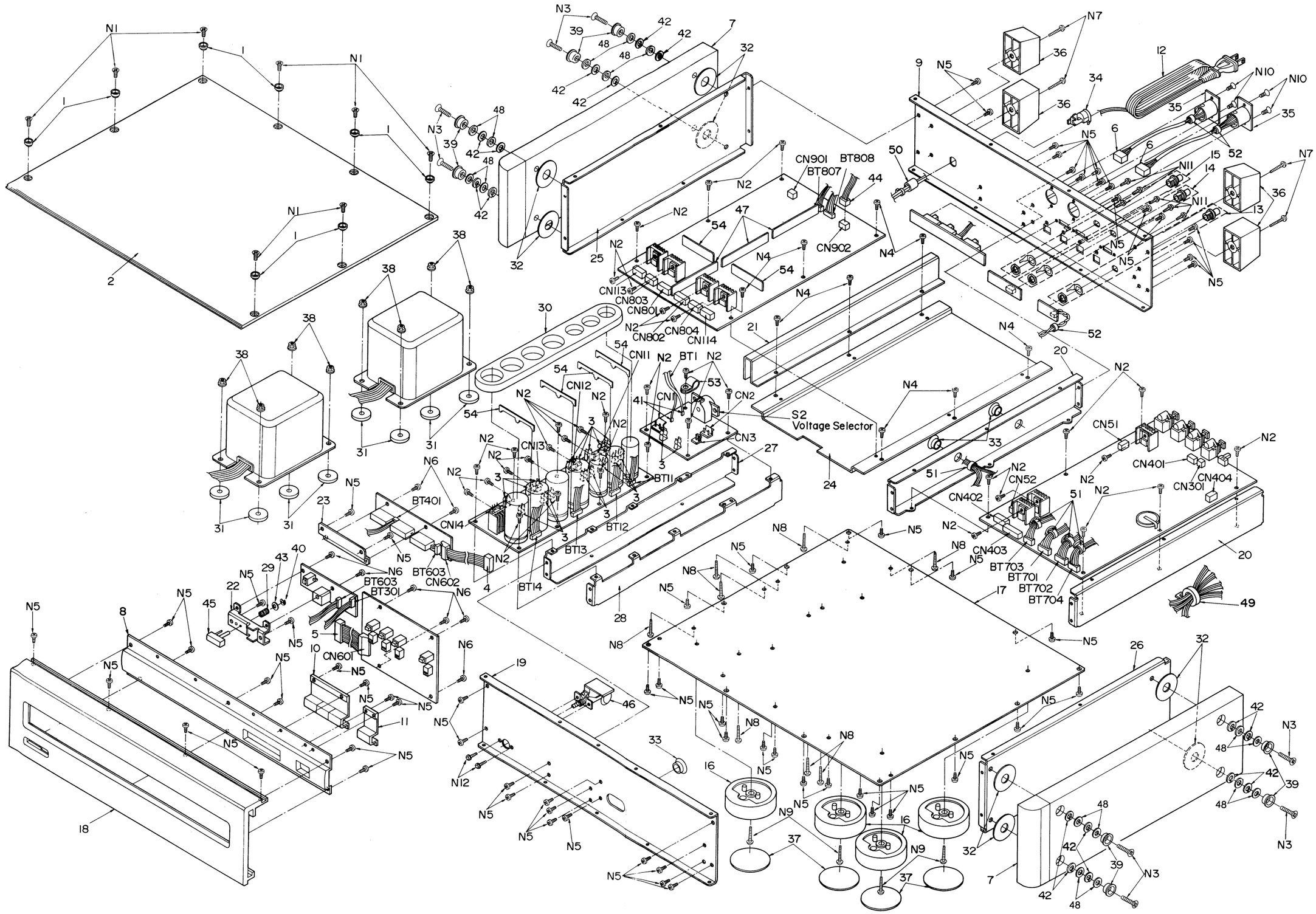
Ref. No.	Part No.	Part Name & Description	Remarks
IC713, 714	M5F78M05L	I. C, REGULATOR	
IC715	TC74HC109AP	I. C, INVERTER GATE	
IC717, 718	M5F78M05L	I. C, REGULATOR	
IC801-808	NJM4580LD	I. C, L. P. F/CLASS AA AMP.	
IC901-904	NJM4580LD	I. C, CLASS AA BALANCE AMP.	
		TRANSISTOR(S)	
Q301	2SC3311A-Q	TRANSISTOR	
Q302-304	UN4113TA	TRANSISTOR	
Q501, 502	2SC3311A-Q	TRANSISTOR	
Q503, 504	UN4114TA	TRANSISTOR	
Q505, 506	2SC3311A-Q	TRANSISTOR	
Q507, 508	UN4214TA	TRANSISTOR	
Q509	UN4114TA	TRANSISTOR	
Q510	UN4214TA	TRANSISTOR	
Q511	UN4114TA	TRANSISTOR	
Q601-608	UN4211	TRANSISTOR	
Q701-704	2SC3311A-Q	TRANSISTOR	
Q801, 802	UN4212TA	TRANSISTOR	
Q803-806	UN4112	TRANSISTOR	
Q901, 902	UN4112	TRANSISTOR	
		DIODE (S)	
D11, 12	D5KC20	DIODE	⚠
D13	D5KC20R	DIODE	⚠
D14	D5KC20	DIODE	⚠
D15	D5KC20R	DIODE	⚠
D16	D5KC20	DIODE	⚠
D17	D5KC20R	DIODE	⚠
D51	MA165	DIODE	
D52	SVD1SR35200A	DIODE	
D101-108	MA165	DIODE	
D301, 302	MA165	DIODE	
D303, 304	MA700TA	DIODE	
D305	MA165	DIODE	
D306	MA700TA	DIODE	
D307	MA165	DIODE	
D401, 402	MA165	DIODE	
D403	MA700TA	DIODE	
D404	MA165	DIODE	
D501-505	MA165	DIODE	
D506	MA700TA	DIODE	
D601-603	LN014304P	L. E. D.	
D604	LN018304P	L. E. D.	
D605-607	LN023428P	L. E. D.	

Ref. No.	Part No.	Part Name & Description	Remarks
D608	LN018304P	L. E. D.	
D705, 706	MA165	DIODE	
D801	MA165	DIODE	
D803-806	MA165	DIODE	
D901, 902	MA165	DIODE	
		COMPONENT COMBINATION (S)	
Z401	EXBF9E472J	COMBINATION PART	
Z501, 502	EXBF5E391J	COMBINATION PART	
Z503, 504	EXBF5E102J	COMBINATION PART	
Z701, 702	DAN401	COMBINATION PART	
		COIL (S)	
L1, 2	SLQX400-D	CHOKE COIL	⚠
L11-21	EXCELDR35V	COIL	
L51-55	EXCELDR35V	COIL	
L302-305	ELEV470KA	COIL	
L306	ELEQKR22JC	COIL	
L502	ELEPK4R7KA	COIL	
L503, 504	ELEQKR22JC	COIL	
L701, 702	ELEQKR22JC	COIL	
L703, 704	EXCELDR35V	COIL	
L801-810	EXCELDR35V	COIL	
		TRANSFORMER (S)	
T1	RFKCHX1000A	POWER TRANSFORMER	⚠
T2	RFKCHX1000B	POWER TRANSFORMER	⚠
		OSCILLATOR (S)	
X401	RSXY4M00M02	OSCILLATOR	
X501	RSXB36M8A01	OSCILLATOR	
X502	RSXB33M8A01	OSCILLATOR	
X503	RSXB24M5A01	OSCILLATOR	
		FUSE (S)	
F1	XBA2C08TB0	FUSE 250V T800mA	⚠
F21-F28	XBA2C08TB0	FUSE 250V T800mA	⚠
		SWITCH (ES)	
S1	ESB99713V	SW, POWER	⚠
S2	SSR187-1	SW, VOLTAGE SELECTOR	⚠
S301	SSS153	SW, DIGITAL IN	
S401	SSSK15	SW, AUX2 (WIDE/NARROW)	
S402	SSSK15	SW, AUX1 (WIDE/NARROW)	
S403	SSSK15	SW, CD (WIDE/NARROW)	
S404	SSG13	SW, TEST	

Ref. No.	Part No.	Part Name & Description	Remarks
S601	RSMD003D	SW, INPUT SELECTOR (CD)	
S602	RSMD003D	SW, INPUT SELECTOR (AUX1)	
S603	RSMD003D	SW, INPUT SELECTOR (AUX2)	
S604	RSMD003D	SW, JITTER FREE	
		BATTERY	
BAT401	BR3032/1HM	LITHIUM BATTERY	
		CABLE (S)	
BT1	REX9135	FLAT CABLE (2P)	
BT11	REX9109S	FLAT CABLE (4P)	
BT12	REX9110S	FLAT CABLE (6P)	
BT13	REX9111S	FLAT CABLE (6P)	
BT14	REX9112S	FLAT CABLE (6P)	
BT301	REX9151Y	FLAT CABLE (2P)	
BT401	REX9109S	FLAT CABLE (4P)	
BT603	REX9113S	FLAT CABLE (4P)	
BT701	REX9117S	FLAT CABLE (7P)	
BT702	REX9116S	FLAT CABLE (7P)	
BT703	REX9119S	FLAT CABLE (5P)	
BT704	REX9118S-1	FLAT CABLE (5P)	
BT807, 808	REX9148Y	FLAT CABLE (2P)	
		CONNECTOR (S)	
CN1	SFDJ5285-02A	CONNECTOR (2P)	
CN2	RJP1A5908	CONNECTOR (8P)	
CN3	RJP1A6007	CONNECTOR (7P)	
CN11	RJP1A3404	CONNECTOR (4P)	
CN12-14	RJP1A3303	CONNECTOR (3P)	
CN51	SJT3415	CONNECTOR (4P)	
CN52	SJT3611	CONNECTOR (6P)	
CN113, 114	SJT3611	CONNECTOR (6P)	
CN301	SJT3213	CONNECTOR (2P)	
CN401	SJT3415	CONNECTOR (4P)	
CN402	SJT3709	CONNECTOR (7P)	
CN403	SJT3005	CONNECTOR (10P)	
CN404	SJT3213	CONNECTOR (2P)	
CN601	SJT3007	CONNECTOR (10P)	
CN602	SJT3711	CONNECTOR (7P)	
CN801, 802	SJT3709	CONNECTOR (7P)	
CN803, 804	SJT3511	CONNECTOR (5P)	
CN901, 902	SJT3319	CONNECTOR (3P)	
		TRIMMER (S)	
CT501	ECRHA020D41	48kHz ADJ.	
CT502	ECRHA020D41	44.1kHz ADJ.	
CT503	ECRHA020D41	33kHz ADJ.	
CT701	ECRHA030E41	44.1kHz DISTORTION ADJ. (L)	

Ref. No.	Part No.	Part Name & Description	Remarks
CT702	ECRHA030E41	44.1kHz DISTORTION ADJ. (R)	
CT703	ECRHA030E41	48kHz DISTORTION ADJ. (L)	
CT704	ECRHA030E41	48kHz DISTORTION ADJ. (R)	
		RELAY	
RLY803, 804	SSY43	RELAY	
RLY805, 806	SSYD4	RELAY	
RLY901, 902	SSYD4	RELAY	

■ EXPLODED VIEW



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Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RGQ0029	SPACER	
2	RFKKHX1000-A	UPPER BOARD ASS'Y	
3	EYF52BC	FUSE HOLDER	⚠
4	REX9114S	CONNECTOR UNIT(7P)	
5	REX9115S	CONNECTOR UNIT(10P)	
6	REX9121-1	CONNECTOR UNIT(3P)	
7	RGK0174	SIDE WOOD	
8	RFKDHX1000AA	BUTTON BASE ASS'Y	
9	RGR0072C-A	REAR PANEL	(EG)
9	RFKHHX1000E	REAR PANEL ASS'Y	(E)
9	RFKHHX1000EB	REAR PANEL ASS'Y	(EB)
10	RFKDHX1000BA	OPERATION BUTTON ASS'Y(1)	
11	RFKDHX1000CA	OPERATION BUTTON ASS'Y(2)	
12	SFDAB31E01	POWER CORD	(E, EG)⚠
12	SJA192	POWER CORD	(EB)⚠
13	RJH9101-D	RCA PIN	
14	RJH9101-R	RCA PIN	
15	RJH9101-W	RCA PIN	
16	RKA0035	FOOT	
17	RKU0013	BOTTOM BOARD	
18	RFKGHX1000-A	FRONT PANEL ASS'Y	
19	RMA0212-1	FRAME, FRONT	
20	RMA0215-1	FRAME	
21	RMA0216	FRAME	
22	RFKNLZ1000BA	POWER BUTTON BASE ASS'Y	
23	RMA0219	FRAME	
24	RMA0227	COVER	
25	RMA0257	SIDE PLATE(L)	
26	RMA0258	SIDE PLATE(R)	
27	RMA0259	FRAME(L)	
28	RMA0260	FRAME(R)	
29	RMB0116	SPRING	
30	RMF0052	SPONGE	
31	RMG0013	RUBBER, P. TRANSFORMER	
32	RMG0117	RUBBER, SIDE WOOD	
33	RMQ0164	BUSH	
34	SHR127	CORD BUSHING	(E, EG)
34	SHR129	CORD BUSHING	(EB)
35	SJSK9-1	CANON CONNECTOR	
36	SKL241	BACK GUARD	
37	SKYD4	FOOT, FELT	
38	SNE4065	NUT	
39	SNE98	SCREW SEAT	
40	XUC2FT	E RING	

Ref. No.	Part No.	Part Name & Description	Remarks
41	SJT777	TERMINAL, POWER CORD	
42	XWE5X12FVC	WASHER	
43	XWG3FZ	WASHER	
44	REX9146	CONNECTOR UNIT(2P)	
45	RFKDLZ1000-A	POWER BUTTON ASS'Y	
46	SMX897	SHIELD COVER (C1)	
47	SJT75-1	BUS BAR	
48	RHW50001	WASHER	
49	RLB0004	CORE	
50	RLB0007	CORE	
51	RLB0008	CORE	
52	RLB0006	CORE	
53	RWB0001	CORD CLAMPER	
54	RJR0027	BUS BAR	
		SCREWS	
N1	XTS3+8FFC	SCREW	
N2	XSN3+8FB	SCREW	
N3	XSS5+35FVC	SCREW	
N4	XTBS3+8FFB1	SCREW	
N5	XTBS3+8JFZ1	SCREW	
N6	XTB3+8JFB	SCREW	
N7	XTB4+12JFZ	SCREW	
N8	XTB4+16FFZ	SCREW	
N9	XTB4+20JFZ	SCREW	
N10	XTW3+8T	SCREW	
N11	XYN26+C5FZ	SCREW	
N12	XYN3+C8FZ	SCREW	
		PACKING MATERIAL	
P1	RPG0600	CARTON BOX	
P2	RPN0240-2	PAD	
P3	SPH6434	PROTECTION SHEET	
		ACCESSORIES	
A1	RQF0758	INST. MANUAL	(E)
A1	RQF0759	INST. MANUAL	(EB)
A1	RQF0760	INST. MANUAL	(EG)
A1-1	RQT0658-G	INST. MANUAL	(EB)
A1-1	RQT0659-D	INST. MANUAL	(EG)
A1-1	RFKSHX1000E	INST. MANUAL	(E)
A1-2	RQA0013	WARRANTY CARD	(E, EG)
A1-3	RQCB0169	SERVICENTER LIST	
A2	SJPD18	PIN CORD	

■ RESISTORS & CAPACITORS

Notes : * Capacity valuse are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R101-104	ERD25FJ1R0	1/4W 1
R105-112	ERDPS2F1002T	1/4W 10K
R113, 114	ERDPS2F3900T	1/4W 390
R115, 116	ERD25TJ105	1/4W 1M
R117, 118	ERDPS2F1000T	1/4W 100
R119, 120	ERDPS2F3900T	1/4W 390
R121, 122	ERD25TJ105	1/4W 1M
R123, 124	ERDPS2F1000T	1/4W 100
R125, 126	ERDPS2F1001T	1/4W 1K
R127, 128	ERDPS2F3301T	1/4W 3.3K
R129, 130	ERDPS2F1000T	1/4W 100
R131, 132	ERDPS2F3300T	1/4W 330
R133, 134	ERDPS2F3301T	1/4W 3.3K
R135, 136	ERDPS2F1001T	1/4W 1K
R137, 138	ERDPS2F3300T	1/4W 330
R139-144	ERDPS2F1000T	1/4W 100
R301	ERDS2TJ103	1/4W 10K
R302	ERDS2TJ222	1/4W 2.2K
R303, 304	ERDS2TJ151	1/4W 150
R305	ERDS2TJ472	1/4W 4.7K
R306	ERDS2TJ562	1/4W 5.6K
R307	ERDS2TJ560T	1/4W 56
R308	ERDS2TJ102	1/4W 1K
R309	ERDS2TJ392T	1/4W 3.9K
R310-312	ERDS2TJ472	1/4W 4.7K
R313, 314	ERDS2TJ561	1/4W 560
R315	ERDS2TJ104	1/4W 100K
R324	ERDS2TJ331	1/4W 330
R325	ERDS2TJ221	1/4W 220
R326	ERDS2TJ472	1/4W 4.7K
R327	ERDS2TJ104	1/4W 100K
R328	ERDS2TJ222	1/4W 2.2K
R329	ERDS2TJ472	1/4W 4.7K
R330	ERDS2TJ822	1/4W 8.2K
R336, 337	ERDS2TJ561	1/4W 560
R339-344	ERDS2TJ561	1/4W 560
R345, 346	ERDS2TJ470	1/4W 47
R347, 348	ERDS2TJ102	1/4W 1K
R401	ERDS2TJ472	1/4W 4.7K
R408	ERDS2TJ104	1/4W 100K
R409	ERDS2TJ393	1/4W 39K
R416-418	ERDS2TJ472	1/4W 4.7K
R501	ERDS2TJ221	1/4W 220
R502-504	ERDS2TJ272T	1/4W 2.7K
R506	ERDS2TJ105T	1/4W 1M
R508	ERDS2TJ105T	1/4W 1M
R510	ERDS2TJ105T	1/4W 1M
R517	ERDS2TJ471	1/4W 470
R518, 519	ERDS2TJ561	1/4W 560
R520, 521	ERDS2TJ222	1/4W 2.2K
R523, 524	ERDS2TJ104	1/4W 100K
R526	ERDS2TJ221	1/4W 220
R527, 528	ERDS2TJ222	1/4W 2.2K
R529	ERDS2TJ104	1/4W 100K
R530	ERDS2TJ331	1/4W 330
R531-533	ERDS2TJ561	1/4W 560
R534	ERDS2TJ221	1/4W 220
R535	ERDS2TJ105T	1/4W 1M
R536	ERDS2TJ103	1/4W 10K
R601-603	ERDS2EJ121	1/4W 120
R604	ERDS2TJ221	1/4W 220
R605-610	ERDS2TJ101	1/4W 100
R611	ERDS2TJ221	1/4W 220
R704-706	ERDS2TJ561	1/4W 560
R707-714	ERDAS3G333	1/4W 33K
R715-722	ERDAS3G223T	1/4W 22K
R723-730	ERDAS3G473	1/4W 47K
R731-734	ERDAS3G101T	1/4W 100
R735-738	ERDAS3G680T	1/4W 68
R739	ERDS2TJ472	1/4W 4.7K
R755	ERDS2TJ272T	1/4W 2.7K
R756	ERDS2TJ102	1/4W 1K
R757, 758	ERDS2TJ271	1/4W 270
R759, 760	ERDS2TJ222	1/4W 2.2K
R761	ERDS2TJ331	1/4W 330
R763, 764	ERDS2TJ222	1/4W 2.2K
R801-804	ERDPS2F8201T	1/4W 8.2K
R805-812	ERDPS2F2201T	1/4W 2.2K
R817-820	ERDPS2F1801T	1/4W 1.8K
R821-824	ERDPS2F2201T	1/4W 2.2K
R825, 826	ERDPS2F2701T	1/4W 2.7K
R827-830	ERDPS2F4701T	1/4W 4.7K
R831-834	ERDPS2F1001T	1/4W 1K
R835-842	ERDPS2F1002T	1/4W 10K
R843	ERDPS2F1000T	1/4W 100
R844	ERDPS2F1001T	1/4W 1K
R845	ERDPS2F3300T	1/4W 330
R846, 847	ERDPS2F3301T	1/4W 3.3K
R848	ERDPS2F3300T	1/4W 330
R849	ERDPS2F1001T	1/4W 1K
R850	ERDPS2F1000T	1/4W 100
R851, 852	ERDPS2F2200T	1/4W 220
R853, 854	ERDPS2F33R0T	1/4W 33
R855, 856	ERD25TJ105	1/4W 1M
R857, 858	ERDPS2F56R0T	1/4W 56
R859, 860	ERDPS2F2700T	1/4W 270
R861, 862	ERDPS2F1000T	1/4W 100
R863, 864	ERDPS2F4702T	1/4W 47K
R871	ERD25TJ333	1/4W 33K
R901, 902	ERDPS2F1501T	1/4W 1.5K
R903-906	ERDPS2F1002T	1/4W 10K
R907, 908	ERDPS2F2202T	1/4W 22K
R909, 910	ERDPS2F1002T	1/4W 10K
R911, 912	ERDPS2F1802T	1/4W 18K
R913-916	ERDPS2F1002T	1/4W 10K
R917, 918	ERDPS2F1502T	1/4W 15K
R919	ERDPS2F1001T	1/4W 1K
R920	ERDPS2F1000T	1/4W 100
R921	ERDPS2F3301T	1/4W 3.3K
R922, 923	ERDPS2F3300T	1/4W 330
R924	ERDPS2F3301T	1/4W 3.3K
R925	ERDPS2F1000T	1/4W 100
R926	ERDPS2F1001T	1/4W 1K
R927	ERDPS2F1000T	1/4W 100
R928	ERDPS2F1001T	1/4W 1K
R929	ERDPS2F3300T	1/4W 330
R930, 931	ERDPS2F3301T	1/4W 3.3K
R934	ERDPS2F3300T	1/4W 330
R935	ERDPS2F1001T	1/4W 1K
R936	ERDPS2F1000T	1/4W 100
R937-940	ERDPS2F5600T	1/4W 560
R941-944	ERDPS2F4702T	1/4W 47K
R945-948	ERDPS2F3300T	1/4W 330
R949, 950	ERDPS2F2702T	1/4W 27K
		CHIP JUMPER(S)
TJ301, 302	ERD25V0R00T	
		CAPACITORS
C1	ECKWKC103PF2	400V 0.01U ⚠
C11-14	ECQV1H104JZ3	50V 0.1U
C15-18	RCQE1224KG-Q	100V 0.22U
C19	ECESX1V682HA	35V 6800U
C20, 21	ECESX1J332HA	63V 3300U
C22-25	ECESX1J332AA	63V 3300U
C51-54	ECA1CPXS330B	16V 33U
C57-62	ECA1CPXS330B	16V 33U
C101-104	ECA1HPXS4R7B	50V 4.7U
C105-120	ECA1EPXS221B	25V 220U
C121-124	ECA1HPXS4R7B	50V 4.7U
C301-303	ECQV1H104JZ3	50V 0.1U
C304-306	ECA1HPXS4R7B	50V 4.7U

Ref. No.	Part No.	Values & Remarks
C307	ECA1CPXS330B	16V 33U
C308-314	ECQV1H104JZ3	50V 0.1U
C315	ECCF1H220K	50V 22P
C316-329	ECQV1H104JZ3	50V 0.1U
C330	ECCR1H101K5	50V 100P
C331	ECQV1H103JZ3	50V 0.01U
C332	ECCR1H560JC5	50V 56P
C333, 334	ECCR1H101JC5	50V 100P
C335	ECCR1H820JC5	50V 82P
C336	ECCR1H101JC5	50V 100P
C337	ECA1HPXS4R7B	50V 4.7U
C401, 402	ECQV1H104JZ3	50V 0.1U
C403	ECQV1H103JZ3	50V 0.01U
C404	ECQV1H104JZ3	50V 0.1U
C501, 502	ECQV1H104JZ3	50V 0.1U
C503-505	ECA1CPXS330B	16V 33U
C506-508	ECEA0JU471	6.3V 470U
C509	ECQV1H104JZ3	50V 0.1U
C510	ECQV1H103JZ3	50V 0.01U
C511	ECCR1H050CC5	50V 5P
C514	ECCR1H050CC5	50V 5P
C517	ECCR1H050CC5	50V 5P
C521, 522	ECCR1H101K5	50V 100P
C523	ECCR1H151JC5	50V 150P
C524	ECCR1H180JC5	50V 18P
C525	ECCR1H101JC5	50V 100P
C526	ECCR1H560JC5	50V 56P
C527	ECCR1H050CC5	50V 5P
C528	ECCR1H390JC5	50V 39P
C529, 530	ECCR1H101K5	50V 100P
C531	ECQV1H104JZ3	50V 0.1U
C532, 533	ECCR1H101JC5	50V 100P
C534	ECCD1H180KC	50V 18P
C535	ECCR1H151JC5	50V 150P
C538-540	ECQV1H103JZ3	50V 0.01U
C541, 542	ECCR1H101K5	50V 100P
C701	ECQV1H103JZ3	50V 0.01U
C702	ECCR1H101K5	50V 100P
C704	ECQV1H105JZ3	50V 1U
C705, 706	ECQV1H104JZ3	50V 0.1U
C707	ECQV1H105JZ3	50V 1U
C708	ECQV1H104JZ3	50V 0.1U
C709-716	ECHR1H151GZ3	50V 150P
C717-724	ECCR1H470JC5	50V 47P
C725-728	ECCR1H330JC5	50V 33P
C729-732	ECQV1H104JZ3	50V 0.1U
C733-740	ECA1HPXS4R7B	50V 4.7U
C741-744	ECA1EPXS221B	25V 220U
C745	ECQV1H105JZ3	50V 1U
C746	ECQV1H104JZ3	50V 0.1U
C747, 748	ECQV1H105JZ3	50V 1U
C749-752	ECQV1H104JZ3	50V 0.1U

Ref. No.	Part No.	Values & Remarks
C753, 754	ECA1CPXS330B	16V 33U
C763	ECQB1H102JZ3	50V 1000P
C764-768	ECCR1H101K5	50V 100P
C769, 770	ECCR1H101JC5	50V 100P
C771, 772	ECCR1H470JC5	50V 47P
C773, 774	ECBT1H120JC5	50V 12P
C775, 776	ECQV1H104JZ3	50V 0.1U
C777, 778	ECA1CPXS330B	16V 33U
C801-808	RCQE1224KG-Q	100V 0.22U
C809-812	ECCD1H680KC	50V 68P
C813, 814	ECHR1H471GZ3	50V 470P
C815-818	ECHR1H222GZ3	50V 2200P
C819, 820	ECCR1H120K5	50V 12P
C821, 822	RCQWT2A105K	100V 1U
C823-826	ECA1EPXS221B	25V 220U
C827, 828	ECHR1H222GZ3	50V 2200P
C829, 830	ECHR1H471GZ3	50V 470P
C831-834	ECCR1H330K5	50V 33P
C835	ECA1CPXS220B	16V 22U
C901-904	RCQE1224KG-Q	100V 0.22U
C905, 906	RCQWT2A105K	100V 1U
C907-910	ECA1EPXS221B	25V 220U
C911, 912	RCQWT2A105K	100V 1U
C913-916	ECA1EPXS221B	25V 220U
C917-920	ECHR1H222GZ3	50V 2200P
C921, 922	ECQV1H104JZ3	50V 0.1U
C923-926	ECCD1H680KC	50V 68P

■ PACKING

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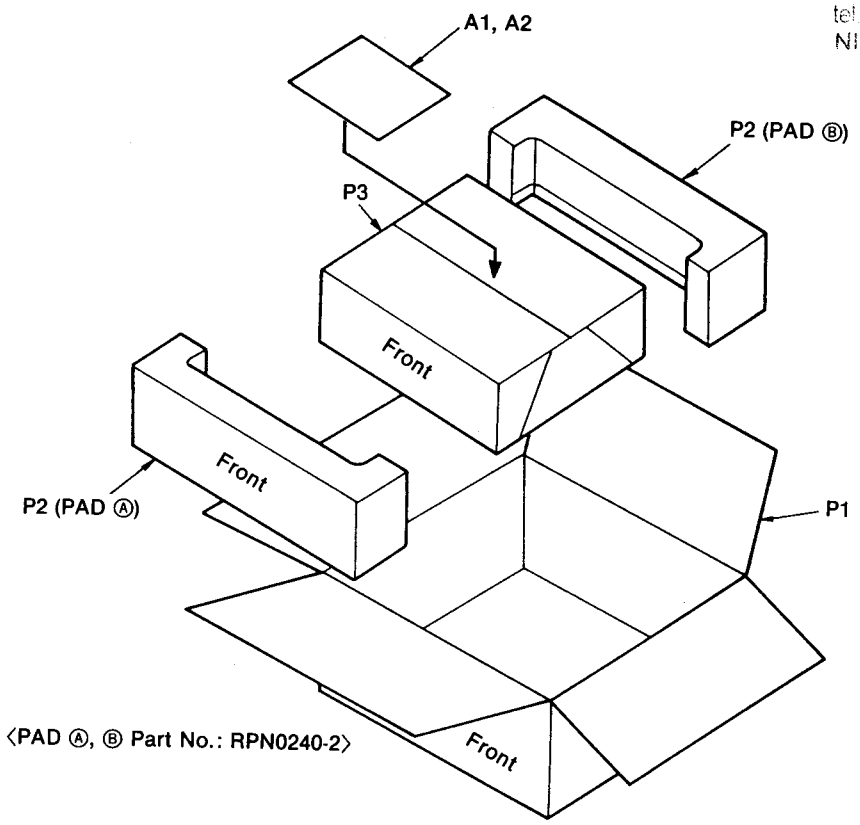
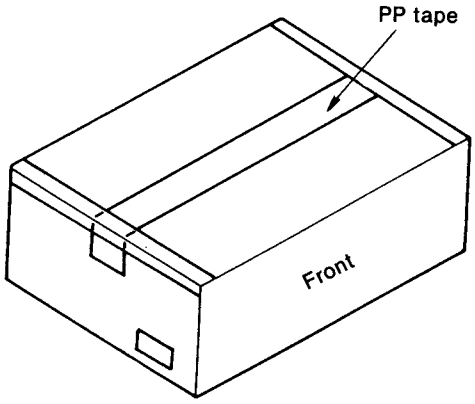
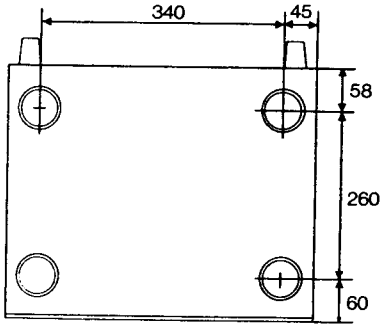


〈PAD Ⓐ, Ⓑ Part No.: RPN0240-2〉



• Position of foot.
(Dimension: mm)



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